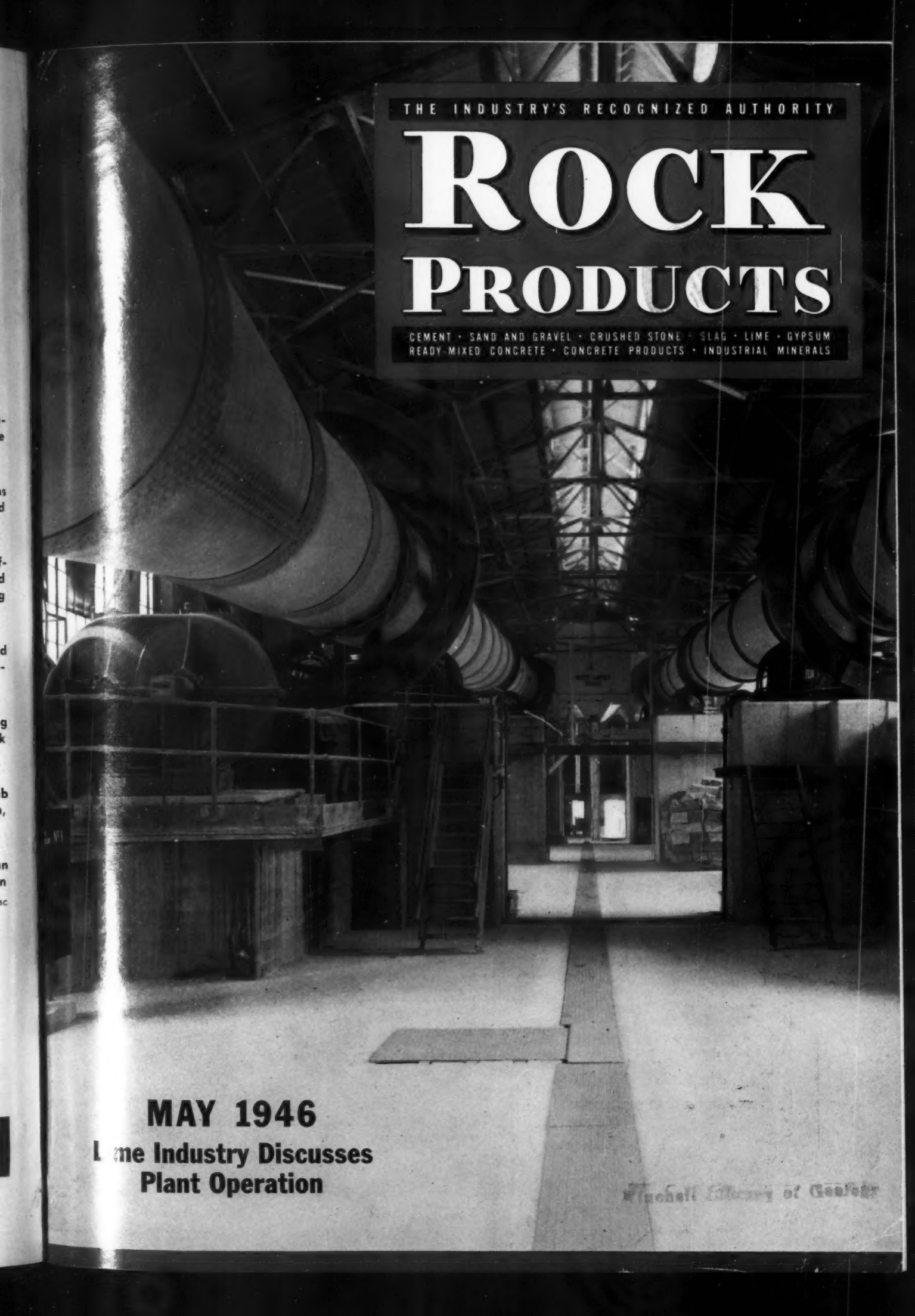


THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

CEMENT · SAND AND GRAVEL · CRUSHED STONE · SLAG · LIME · GYPSUM
READY-MIXED CONCRETE · CONCRETE PRODUCTS · INDUSTRIAL MINERALS

MAY 1946

Lime Industry Discusses Plant Operation

Mitchell Library of Geology

SPEED

MODERN BY-WORD FOR AMERICAN INDUSTRY.....

Open view of the Williams "Slugger" Crusher showing heavy duty hammers, liners and discs.

ONE OPERATION DOES THE JOB

SPEED plus satisfactory work is essential in America today. Along these lines the Williams "Slugger" Crusher and Pulverizer now makes it possible to crush large pieces of stone weighing from 75 to 100 pounds to 1¼", ¾" or agricultural limestone in One Operation. This not only eliminates costly sledging but also does away with the unnecessary expense of a primary crusher.

The "Slugger" represents the most advanced type of crushing equipment on the market today, and with seven sizes to choose from, producing from 4 to 30 tons per hour, every producer whether large or small can now afford to install a Williams.

Outstanding "Slugger" Features

- **MANGANESE STEEL HAMMERS.** Heavy Duty Slug End Hammers are standard equipment in the "Slugger."
- **HAMMER ADJUSTMENTS OVERCOME WEAR.** Discs are arranged so that the hammers can be set out as they wear on the end.
- **MANGANESE STEEL ADJUSTABLE BREAKER PLATE.** Adjustable towards the hammers.
- **ELECTRIC STEEL FRONT END.** The part which holds the breaker plate is electric steel casting—3½ times stronger than cast iron.
- **COVER LINERS 1" THICK.** Manganese steel liners.
- **SIDE LINERS 1" THICK.** Manganese steel liners.
- **SEVEN SIZES.** 30 to 150 horse power, stationary or portable models.

THE WILLIAMS PATENT CRUSHER & PULVERIZER CO.

800 ST. LOUIS AVE. ST. LOUIS, MO.

WILLIAMS FINE GRINDING EQUIPMENT WITH AIR SEPARATION

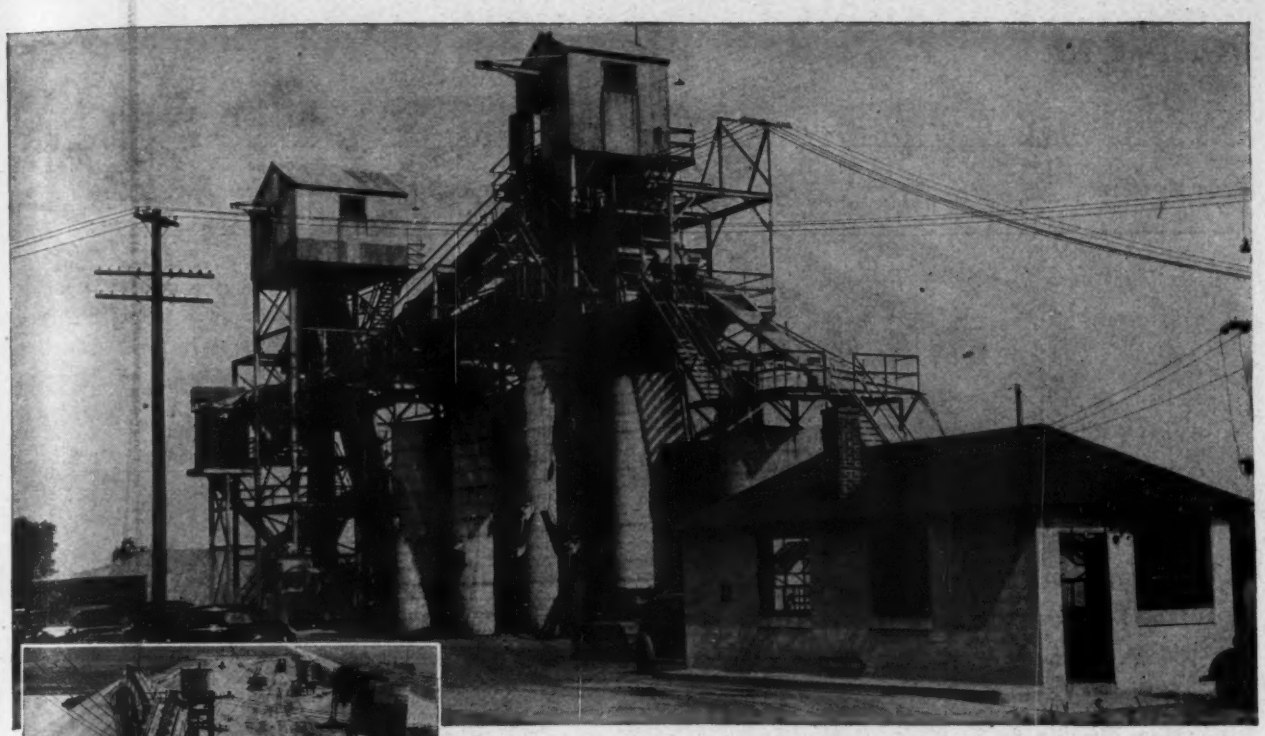
For faster, more efficient fine grinding of limestone, lime, coal, talc, etc., there is a Williams Roller Mill with Air Separator to fit your requirements. Finenesses from 100 to 400 mesh.

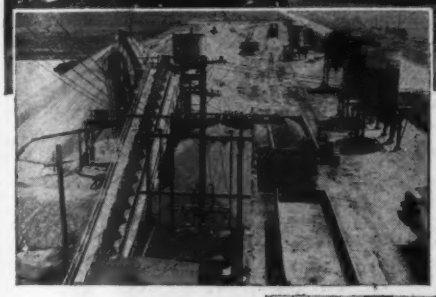
Williams also builds Impact Mills with Air Separation; Mechanical Air Separators for classifying finely ground material or taking the fines out of dry material.

★

WILLIAMS

PATENT CRUSHERS GRINDERS SHREDDERS

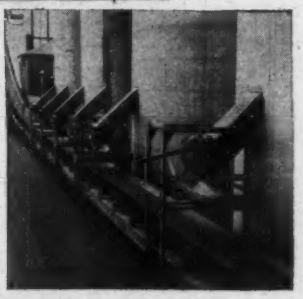




A SAND & GRAVEL PLANT

with operating flexibility to meet all specifications

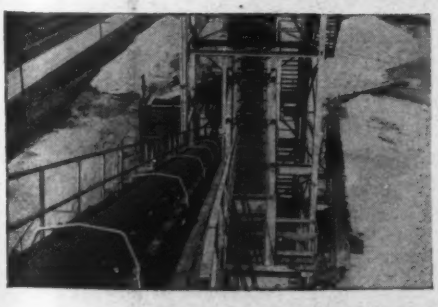
The two illustrations above show the complete plant, and a bird's-eye view of loading and stocking conveyors. At right: belt conveyor handling sized products from silos, to stocking or loading conveyors.



With plant details executed by Link-Belt Company, and featuring Link-Belt belt conveyors, the plant of The Rock Island Sand & Gravel Company was designed both to take care of existing specifications and future changes and expansion. The capacity is 1,500 tons in 8 hours.

Other Link-Belt equipment includes a 66-foot dredging elevator, with perforated dewatering buckets, for supplying the plant with material from the dredge sump; and a 15-foot diameter Rotoscoop, for making concrete sand. The plant also produces masons' sand and other special products.

Link-Belt can give you not only the economy and effectiveness of standardized equipment such as conveyors, elevators, Rotoscoops, Shaw Classifiers, screens, etc., but also a wealth of experience in designing complete sand-gravel plants. Let us give you further information.



At left: View of conveyor handling gravel from screen.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8.
Offices in Principal Cities. 10,280

Right: the ROTO-SCOOP, an efficient, compact, self-contained dewatering unit for all types of sand.

LINK-BELT

SAND AND GRAVEL HANDLING AND PREPARATION EQUIPMENT

VOLUME 49 **ROCK PRODUCTS** NUMBER 5

MAY, 1946

Bror Nordberg, *Editor*

Charles Hoefer, Jr. *Manager*

Nathan C. Rockwood, *Editorial Consultant*

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Ralph S. Torgerson, Managing Editor
H. E. Swanson, Associate Editor
M. K. Smith, Assistant Editor

Contributing Editors
Victor J. Azbe
Dr. F. O. Anderegg
M. W. Loving

L. V. Rodda, Mgr., Circulation Sales
H. Goodenow, Circulation Director
C. P. Teats, Field Representative
Thornell Barnes, Director of Research
Milton M. Myers, Art Director
C. M. Hancock, Production Manager

District Offices

Eastern Area—E. H. St. Jules, Manager; John F. Lockitt, Assistant, 522 Fifth Ave., New York 18, Tel. Murray Hill 2-7888.

Central Area—F. S. Ruggles, Manager, Hanna Bldg., Cleveland 15, Tel. Main 4302.

Midwest Area—M. B. Nylund, Manager, 309 W. Jackson Blvd., Chicago 6, Tel. Harrison 7890.

Western Area—L. C. Thaon, Manager, 309 West Jackson Blvd., Chicago 6, Tel. Harrison 7890.

Pacific Area—Duncan Scott & Co., Mills Bldg., San Francisco 4, Tel. Sutter 1395. In Los Angeles 13, 408 Pershing Square Bldg., Tel. Michigan 0921.

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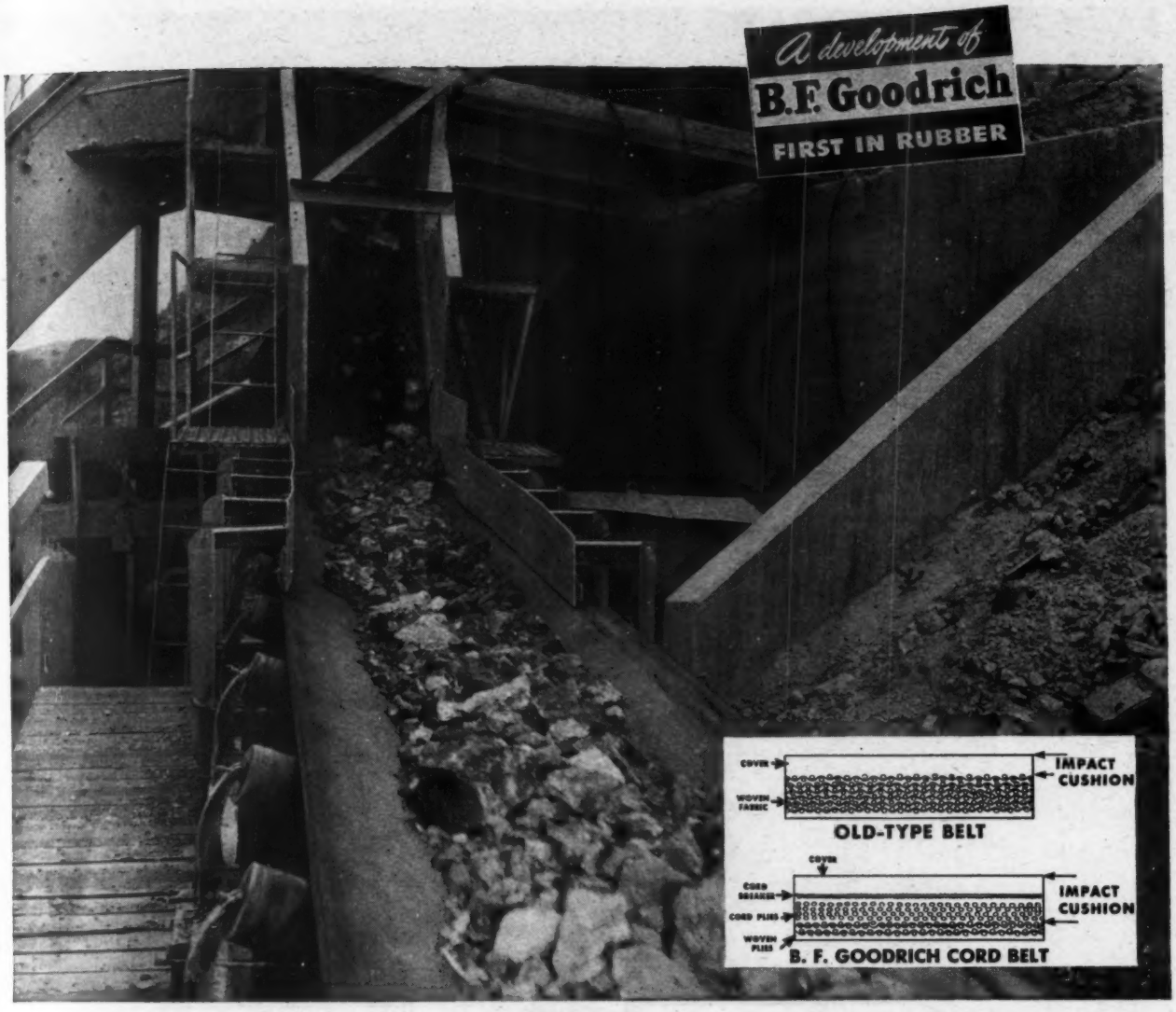


Handles nearly 6,000,000 tons in 2 years—still no signs of wear!

Cord conveyor belt is a typical example of B. F. Goodrich product development

THIS was a tough one: minus 16" crusher run limestone; 10' drop from a steep chute; average 800 tons per hour 12 hours a day with peak loads up to 1400 tons per hour.

No wonder the operator of this cement company selected B. F. Goodrich cord belt for the job. In this new construction, each cord in each ply is completely surrounded by rubber. Then a layer of parallel cords called a transverse breaker, also embedded in rubber, is laid *across* the belt — floating in rubber above the carcass and covered at the surface by another rubber layer.

Because each cord is embedded in rubber, the impact cushion, as shown in the diagram, is very much greater than that in conventional belt construction. And the transverse breaker allows the surface to give as the cords spread at the moment of heavy impact. Cutting and gouging are prevented due to the *lengthwise* stretch.

This shock absorbing action is responsible for the long, trouble-free life of the B. F. Goodrich cord belt. Often, it's 25% to 50% more than that of ordinary belts — occasionally a lot more. The belt in the picture has handled nearly 6,000,000 tons of rock in 2 years — *and shows no signs of wear.*

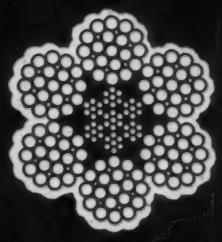
Ask your B. F. Goodrich distributor to tell you more about the cord belt. He can cite numerous case histories where substantial money savings have been made through the use of the cord belt. Or, if there's no distributor near you, please write *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

RUBBER *and* SYNTHETIC *products*

MADE TO ORIGINAL SPECIFICATIONS
Genuine Jeffrey Replacement Parts
Not similar to, but exactly like or even better than original equipment. That's the Jeffrey rule. That's why knowing production men insist on replacing with Jeffrey maintenance items.
Look For The
Trade Mark
JEFFREY
ESTABLISHED 1877

Best for Heavy Hoisting



UPSON-WALTON
6 x 19 FILLER WIRE CABLE

FOR boom falls on shovels and draglines, for operating ropes on vertical lift bridges, for pan hoist and counterweight ropes on car dumpers—industry after industry has heavy hoisting conditions which are best served by Upson-Walton 6 x 19 Filler Wire Perfection Layrite.

Perfection grade because this improved plow steel is the strongest and toughest and most resistant to wear of all the grades of wire used to make rope.

Layrite because this fine *pre*formed wire rope results in longer life, greater safety, greater economy.

Hemp center or, where hoisting conditions are extremely severe, IWRC (independent wire rope center)

Upson-Walton, 6 x 19 Filler Wire cable is the wire rope which provides a fine balance between coarser ropes, which have good abrasion resistance but poor flexibility, and flexible ropes with less abrasion resistance. *Upson-Walton 6 x 19 Filler Wire cable combines good flexibility with good abrasion resistance.*

The filler wires support uniform outer wires, thereby giving the rope a greater resistance to crushing and other damage where radial pressures and operating conditions are severe. This construction provides a high percentage of reserve or internal strength.

It will pay you to specify (and supply) Upson-Walton 6 x 19 Filler Wire cable—perfection grade—Layrite preformed —for heavy hoisting duty.

Established 1871

Copyright 1946—The Upson-Walton Company

THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope. Wire Rope Fittings. Tackle Blocks

MAIN OFFICES AND FACTORY: CLEVELAND 13, OHIO

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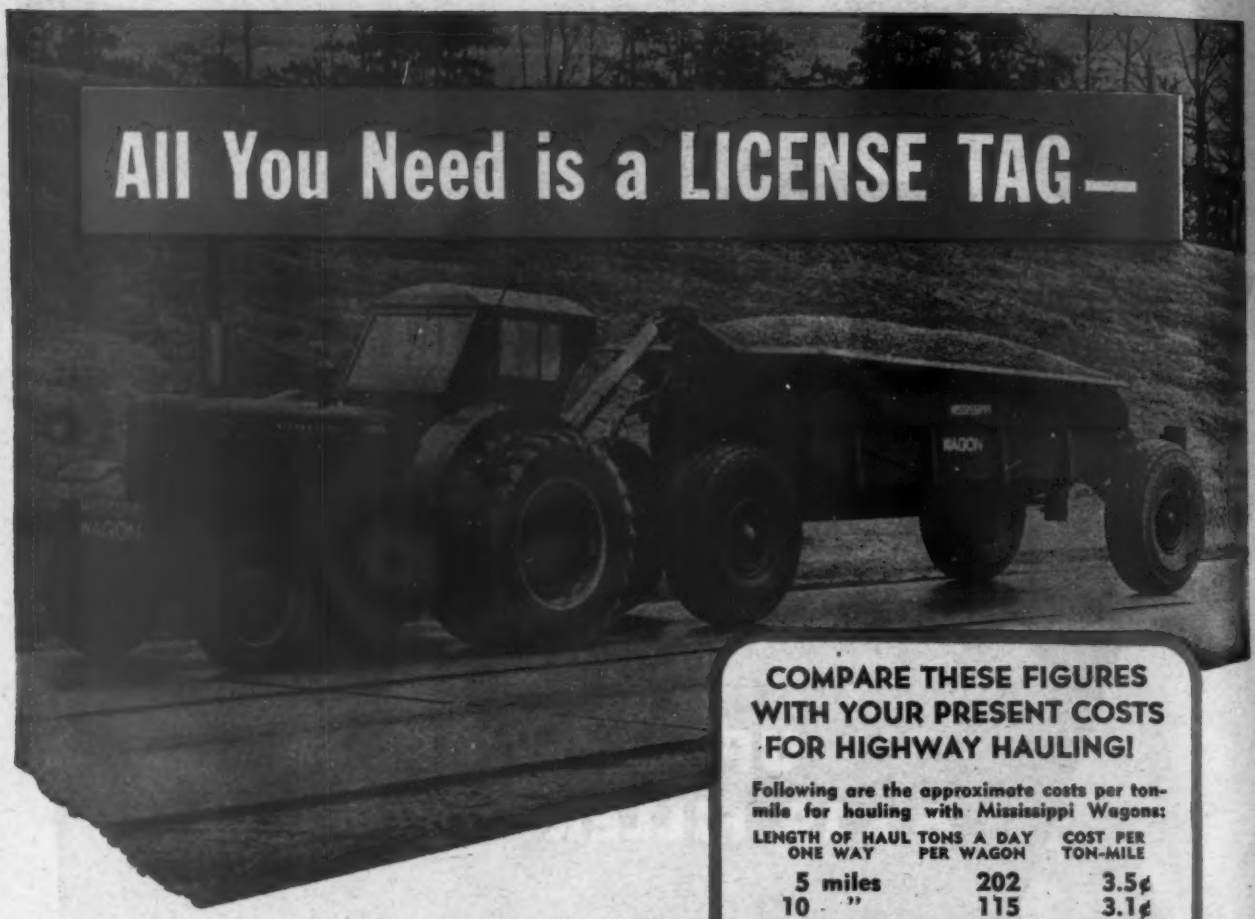

—to Haul on the Highway with MISSISSIPPI WAGONS!

* * *

Yes—and Mississippi Wagons are the ONLY hauling units of their type on which a license tag can be used!

Four-axle construction, made possible by the weight-transfer feature found exclusively on Mississippi Wagons, is the reason for their ability to operate efficiently, legally, and economically both ON and OFF the highway.

Four axles not only provide maximum flotation over soft ground on construction work, but serve to reduce axle-loadings for road and street travel. As a result, the Mississippi Wagon is the only bottom-dump hauling unit powered by a heavy industrial tractor that can haul payloads of 27,000 pounds on highways without exceeding the 18,000-pound axle-loading limit set by most states.

With all-round performance like this available, why make or carry a double investment in hauling equipment? Let a single investment in MISSISSIPPI WAGONS put you in a position to handle both construction and long-haul jobs . . . at costs that will enable you to meet and beat tough competition in the big days ahead.

COMPARE THESE FIGURES WITH YOUR PRESENT COSTS FOR HIGHWAY HAULING!

Following are the approximate costs per ton-mile for hauling with Mississippi Wagons:

LENGTH OF HAUL ONE WAY	TONS A DAY PER WAGON	COST PER TON-MILE
5 miles	202	3.5¢
10 "	115	3.1¢
15 "	81	2.9¢
50 "	27	2.6¢

The figures are based on a 10-hour day, an average speed of 20 m.p.h., payloads of 27,000 pounds, 10 minutes loading and dumping time per trip, and a total daily cost of $35.00 per Wagon, covering fuel, lubricants, driver's wage (average), reserves for depreciation, repair parts and labor, tire wear over abrasive concrete roads, insurance, social security, and miscellaneous expense.

M-R-S MANUFACTURING COMPANY, Jackson, Mississippi

MISSISSIPPI WAGON *The World's Most Modern Hauling Unit*

Traylor Grinding Mills On The Job

Just a few of the hundreds of installations in cement, mining and chemical processing plants where Traylor Ball Mills, Rod Mills and Compartment Mills are "on the job" and giving entire satisfaction.

The latest improvements and features that operators demand for better production are constantly being built into Traylor Grinding Mills, thus assuring best results at greater profit.

If your grinding needs call for a "coarse" - "medium" - "fine" - or - "extra fine" product there is a Traylor Grinding Mill . . . to produce that product in the quantity you need . . . of the exact character required . . . at minimum cost . . . and low maintenance expense. Or, if you need a specially designed mill, Traylor engineers are qualified to build it for you.

The "know-how" of Traylor engineers is yours to use in helping to work out your problems. Ask our representative to call at your convenience or write for Bulletin #2103.

WE BUILD

- Jaw, Gyratory and Reduction Crushers
- Crushing Rolls
- Compartment Mills
- Ball, Tube, Rod and Pug Mills
- Rotary Kilns, Coolers, Dryers and Slakers
- Rotary Screens
- Apron Feeders and Grizzleys
- Wash Mills
- Scrubbers

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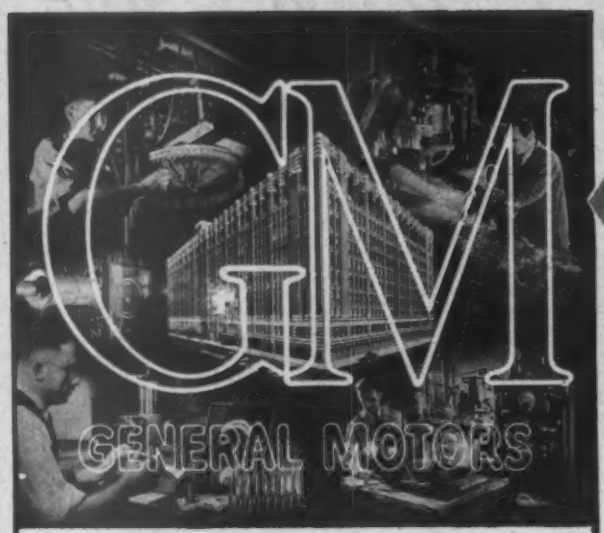


DIESEL POWER

WHAT'S IN A NAME PLATE?

IN THIS CASE the name plate holds the secret of the satisfaction you will have with Diesel power.

For this name plate is evidence of some of the most intensive work ever undertaken in the General Motors Research Laboratories.

It started back when all Diesels were cumbersome, stationary engines. But the Diesel idea looked good. Maybe it could be made more useful. So GM experts went to work on it.

THEY MADE IT two-cycle—quick to respond to additional loads because power is furnished on every downward stroke of each piston. They eliminated all the old surplus weight and size of former Diesel engine practice and built in a more than ample supply of horsepower. They developed unit injection—did away with high-pressure fuel tubing. They designed Uniflow scavenging—made a clean-burning, efficient engine. Then to top it all, they simplified the design and made wearing parts easy to get at, and interchangeable even between engines with different numbers of cylinders.

ALL THIS has added up to today's sturdy, hard-working, money-saving GM Diesel—a Diesel that brought the era of the GM locomotive and its streamliners, a Diesel that has changed the picture of marine propulsion—an industrial Diesel ready to take on the toughest jobs of transportation, construction, fishing, mining, lumbering and anything else you have to offer. Yes, ready to take them on and do them more reliably, at lower cost.

FEATURES of the GM "71" DIESEL

- Compactness
- Quick starting under all conditions
- 2-cycle, smoother operation
- Easy accessibility of wearing parts
- Unit injectors—no high-pressure piping
- Maximum parts interchangeability regardless of number of cylinders
- Uniflow performance at high altitudes

A nation-wide organization of GM Diesel sales and servicing dealers stands ready to handle every need for parts and service.

DETROIT DIESEL ENGINE DIVISION

DETROIT 23, MICH. • { SINGLE ENGINES . . Up to 200 H.P. / MULTIPLE UNITS . . Up to 800 H.P.

GENERAL MOTORS

No.1 ROCK WORKER

WHERE the going is tough — where tires must stand the gaff and grind of rough and rocky ground — Goodyear's great Hard Rock Lug tires are first choice year after year. For in mine, quarry, dam-building and other construction work that beats the heart out of ordinary tires, Hard Rock Lugs stand up longer, take it better, and come steadily back for more. Years of standout service prove *that*. And today, for all practical purposes, they are the equal of prewar tires in natural rubber content. That's why you'll be time and money ahead with Hard Rock Lugs on *your* rock-work units.

BUY and SPECIFY GOODYEAR—*it pays!*

—and here are the reasons why:

MASSIVE LUG BARS armor the tread and sidewalls against cutting

SELF-CLEANING TREAD doesn't pack up, bites deeper, pulls better

EXTRA-THICK UNDERTREAD lengthens tire life—protects carcass from bruises

SUPERSTRONG CARCASS of Goodyear's patented Rayotwist Cord—made from rayon—adds more stamina, long life

MULTIPLE BEADS of high-tensile steel wire insure non-slip anchorage to rim

Rayotwist—T.M. The Goodyear Tire & Rubber Company

GOODYEAR

MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND

COMPLETE PLANTS

for the manufacture of

Cement, Lime, Gypsum and other

ABOVE: Ring Gear for large rotary cement kiln—sectionalized for convenience in transportation and erection. Cast in our own steel foundry and machined in our own shops.

AT RIGHT: One of four Vulcan Rotary Kilns in a modern cement plant, showing improved method of rivetless tire mounting and oil-tight casing around ring gear.

One Contract
Undivided Responsibility

Vulcan Iron Works has increased its engineering and manufacturing facilities and is now prepared to design, construct and equip COMPLETE PLANTS for the manufacture of Cement, Lime, Gypsum and other allied products.

Foremost in the manufacture of Rotary Kilns, Coolers, Dryers, Retorts, etc., Vulcan has led the way for nearly half a century in their continuous development and improvement. During this long period hundreds of installations have been made—in practically every phase of the Rock Products, Metallurgical and Chemical-Processing Industries—covering every re-

Designed and Constructed Allied Products

quirement for the Grinding, Calcining, Cooling, Drying, Roasting, Leaching, Dehydrating, etc., of inorganic materials.

This vast experience has now been supplemented by the addition to our staff of Mr. Mark R. Woodward and Mr. Leon D. Holden—both of whom are well known throughout the Rock Products Industries as prominent designers, constructors and operators of complete plants.

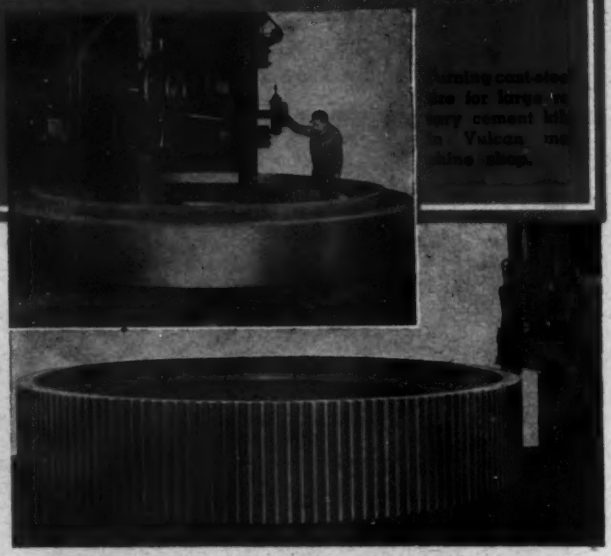
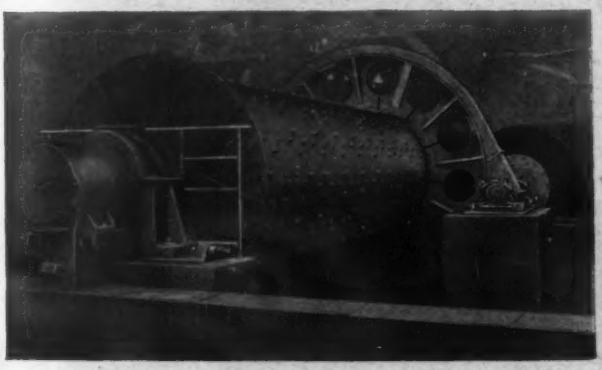
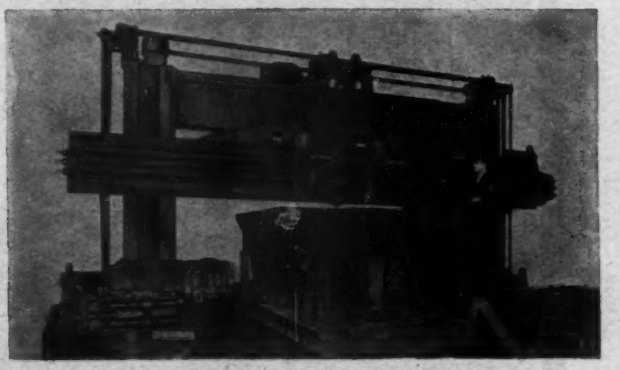


Illustration above shows method of cutting large gears. Smaller gears are cut on other machines of a different type.



One of three similar Vulcan Tube Mills lined with Vulcan alloy-steel castings, in a cement plant near Lima, Peru.



Vulcan Shops are equipped to machine the largest castings we produce. Illustration above shows large casting on planer.

Other Vulcan products include Sugar Mills, Mining Machinery, Electric Hoists, Steam, Gasoline, Diesel and Diesel-Electric Locomotives, Briquetting Machinery, Steel Castings, Steel Fabrication and Heavy Special Machinery.

Vulcan Steel Foundry. Fully equipped to produce carbon- or alloy-steel castings up to approximately 40,000 lbs. in weight.

At extreme right is shown the steam power plant.

VULCAN IRON WORKS

Wilkes-Barre, Pa., U. S. A.

Men Who Know Shovels Say-

"BUCKEYE CLIPPERS ARE 'TOPS' ON ANY JOB!"

OPERATORS SAY: "They're sweet jobs because they handle so easily!"

Their long, wide crawlers and correct balance provide easy maneuverability. Positive chain crowd moves any load. "Mevac" metered vacuum power control, gives instant, smooth response—"real feel."

MECHANICS SAY: "We know very little about Buckeye Clippers. They must be rugged, because they're so seldom down for repairs."

Right! Clippers have the in-built stamina to "stand the gaff" on the toughest work. Every part and material—clutches, brakes, bearings—is tested to assure plenty of capacity. All components easy to get at.

OWNERS SAY: "They cut costs to the bone! They're wizards at turning out big yardages at lower overall costs."

Buckeye better engineering and fast, efficient "Mevac" control permits Clippers to clip time off the operating cycle. Gasoline, diesel or electric powered Clippers increase yardages—cut costs.

- √ ½ and ¾ Yard
- √ Completely Convertible
- √ "Mevac" Vacuum Power Control
- √ Rugged Construction—Low Cost Operation

Check the performance of Buckeye Clippers for low cost material handling, stripping and excavation.

BUCKEYE TRACTION DITCHER COMPANY
FINDLAY, OHIO

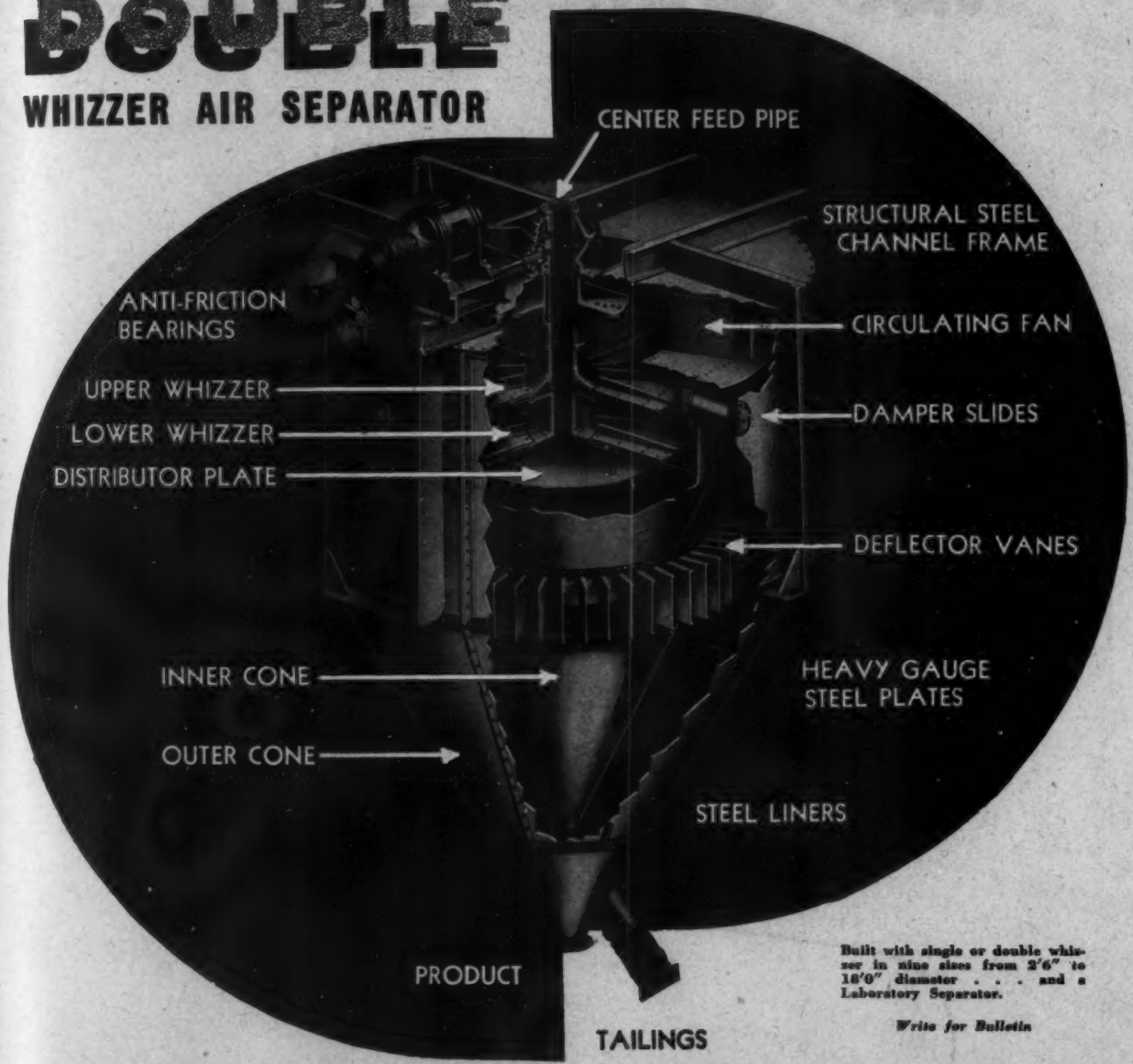
built by **Buckeye**

CONVERTIBLE SHOVELS—BULLDOZERS—ROAD WIDENERS
TRENCHERS—MATERIAL SPREADERS—R-B FINEGRADERS

For Product Uniformity and Fineness Control

specify the Raymond

DOUBLE WHIZZER AIR SEPARATOR



Built with single or double whizzer in nine sizes from 2'6" to 18'0" diameter . . . and a Laboratory Separator.

Write for Bulletin

IT is the *double action* of the two sets of revolving whizzer blades in the Raymond Mechanical Air Separator that gives superior results in classification:—

(1) Closer separation of the fines.

(2) Cleaner tailings returned to mill.

(3) Uniformity in finished particle size.

(4) Easy fineness control within wide limits.

It offers advantages of higher capacities in closed circuit grinding operations and greater ease in meeting today's exacting specifications in the finished products.

For classifying both standard grade and high early strength cement, hydrated lime, gypsum, slate dust, chemicals, non-metallic minerals and manufactured products, the whizzer-type Raymond Separator is the logical choice.

RAYMOND PULVERIZER DIVISION

COMBUSTION ENGINEERING COMPANY, INC.

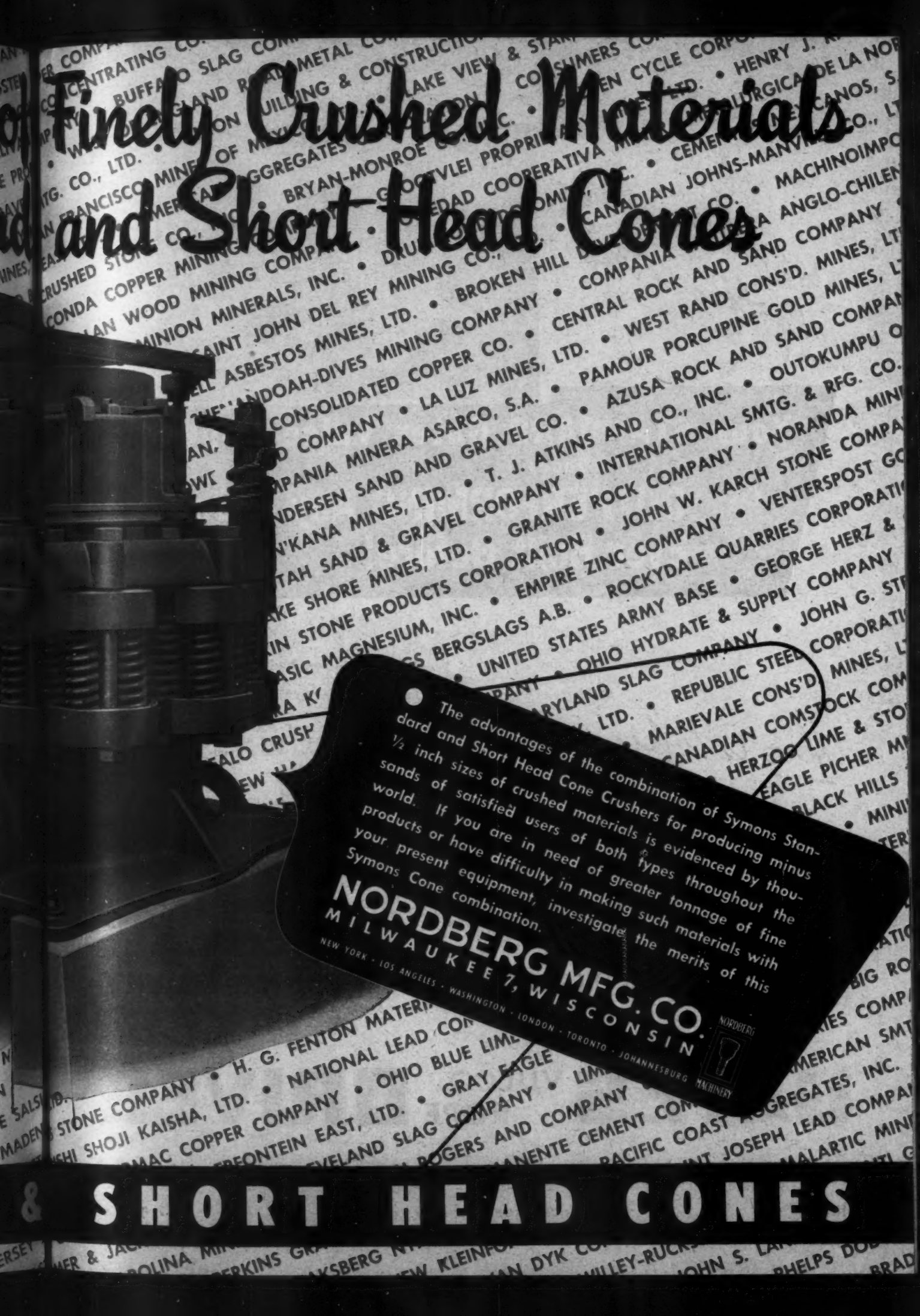
1307 North Branch St. **Chicago 22, Illinois**

Sales Offices in Principal Cities **Canada: Combustion Engineering Corp., Ltd., Montreal**

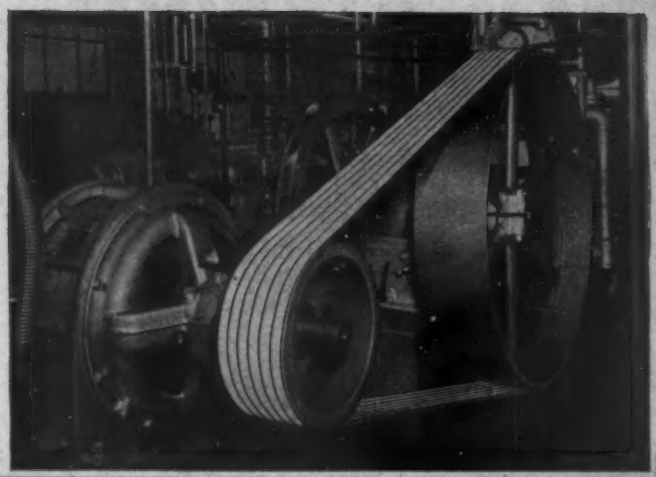
Thousands of Producers of Fa

use Symons Standard

SYMONS STANDARD &


Finely Crushed Materials
and Short Head Cones
The advantages of the combination of Symons Standard and Short Head Cone Crushers for producing minus ½ inch sizes of crushed materials is evidenced by thousands of satisfied users of both types throughout the world. If you are in need of greater tonnage of fine products or have difficulty in making such materials with your present equipment, investigate the merits of this Symons Cone combination.
NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN
NEW YORK · LOS ANGELES · WASHINGTON · LONDON · TORONTO · JOHANNESBURG
NORDBERG MACHINERY
& SHORT HEAD CONES

it's worth knowing why this is true



Your STANDARD Gates Vulco Ropes

Are Today

OUTPERFORMING Any V-Belts Ever Built Before!

Early in the war it was found that our Army's tanks, tractors and self-propelled big guns in combat service required V-belts far superior in strength and durability to any V-belts ever built before. Gates developed these greatly superior V-belts through intensified, specialized research —and here is why this fact is now important to YOU:—

Here is why—

Every improvement developed by Gates for U. S. Combat Units—and many later improvements, also—have been added, day by day, to the quality of the Standard Gates Vulco Ropes which have been delivered to you.

That is why, even while the war was still in progress, you were getting in your Standard Gates Vulco Ropes a product built to far higher service standards than any V-belts ever built by anyone before the war.

And that is only half the story. Through continuing specialized research, the service qualities of these superior Gates Vulco Ropes have been still further improved as all of Gates facilities and energies have been returned to the service of industry.

These are the simple reasons why the standard Gates Vulco Ropes you are getting today are delivering far better service than any V-belts ever built before!

Gates

THE MARK OF SPECIALIZED RESEARCH

All Gates V-Belts are Built With The Patented CONCAVE SIDE

THE GATES RUBBER COMPANY

Engineering Offices and Jobber Stocks in All Large Industrial Centers

466

GATES VULCO ROPE DRIVES

CHICAGO 6, ILL., 549 West Washington. NEW YORK CITY 3, 215-219 Fourth Avenue. ATLANTA 3, GA., 521 C. & S. Nat'l Bank Bldg.

LOS ANGELES 21, CAL., 2240 E. Washington Blvd. DENVER 17, COLO., 999 S. Broadway. DETROIT 2, MICH. 223 Boulevard Bldg.

PORTLAND 9, ORE., 333 N.W. 5th Ave. DALLAS 2, TEXAS, 1710 N. Market St. SAN FRANCISCO 3, CAL., 170 Ninth St.

CUT HANDLING COSTS

Now—and years from now!

Whether it's digging in the pit or loading from stockpile, these modern P&H's cut your costs in two ways: *first*, with faster operation; *second*, with less "down time."

HYDRAULIC CONTROL—faster, easier, velvety action—easier on both machine and operator.

PLANETARY CHAIN CROWD—rapid reversing, more accurate; outlasts 25 to 30 crowd cables.

TRUE TRACTOR TYPE CRAWLERS—smoother, more dependable travel; freedom from the usual crawler troubles; easier steering.

WELDED CONSTRUCTION THROUGHOUT—rolled alloy steels make them huskier, shock-proof; no needless deadweight.

Be ready for the busy years ahead with these and other P&H added values. Get *all* your excavator dollars will buy. Write for full information.

P&H **EXCAVATORS**

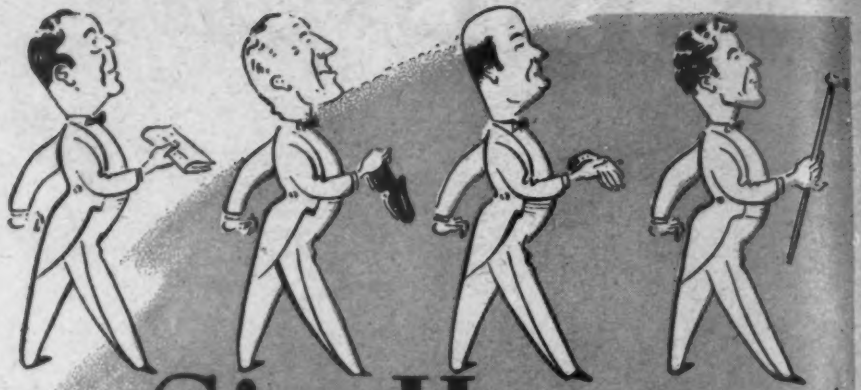
4465 W. National Ave.
Milwaukee 14, Wis.

HARNISCHFEGER
CORPORATION

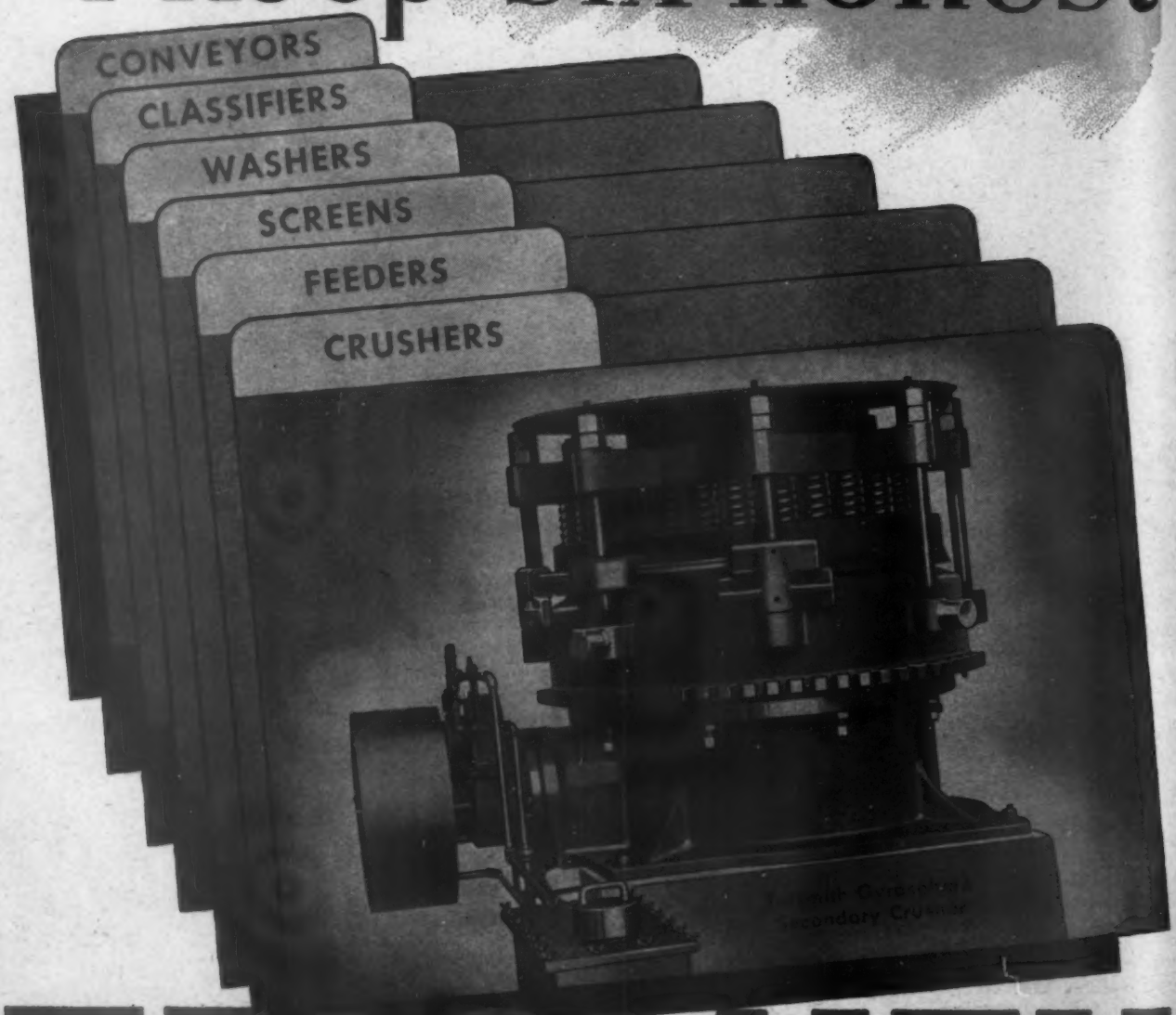
EXCAVATORS • ELECTRIC CRANES • ARC WELDERS | P&H | HOISTS • WELDING ELECTRODES • MOTORS

P&H TRUCK CRANES are dual-powered. There's no compromise between mobility and work-ability. And with remote control, you get one-man operation. Fully convertible for all classes of work.

P&H EXCAVATORS are built in all sizes up to 8 cubic yards capacity; gasoline, Diesel or electric powered. Write for literature.



"I Keep Six Honest



TELSMITH

I keep six honest serving men
They taught me all I knew;
Their names are What and Why and When
And How and Where and Who."
—KIPLING

Serving Men...

WHAT *makes a Telsmith-equipped rock crushing or sand and gravel plant* different *and* better? Telsmith engineers *scientifically* design, build and equip your plant. It is co-ordinated and balanced to give you—finer sizing . . . improved products . . . lowest costs.

WHERE *do you save?* Telsmith plants—laid out and equipped to save power and labor—have fewer mechanical units. Investment is low. Consistently large output and exceptional product quality, combined with low maintenance and operating costs, insure your profits.

HOW *far does Telsmith Service go?* All the way! Telsmith engineers study the deposit, ground topography, etc.; note available power and shipping facilities; consider the products, their market and the competition. Your plant's size, design, and requirements are then determined on the basis of all these facts.

WHEN *did Telsmith service originate?* Forty years ago. That's why Telsmith engineers *know how* to select the most economical method and right equipment for each operation; to design and build highly individualized plants that run smoothly and profitably.

WHY *are Telsmith engineers* without bias *in recommending equipment?* Telsmith designs and builds *all types* of crushers and an equally complete line of feeders, screens, washers, classifiers, conveyors, elevators, etc., in a wide and varied range of types and sizes best suited to your particular conditions and needs.

WHO *is responsible for results?* Telsmith . . . and only Telsmith! You deal with but one concern . . . thoroughly competent and willing to take complete and undivided responsibility . . . and financially able to make good the Telsmith guarantee of results.

S-2

Consult Telsmith engineers . . . Get Bulletin E-11

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St. New York 17, N.Y. — 13 Commercial Trust Bldg. Philadelphia 2, Pa. — 247 Third St. Cambridge 42, Mass. — Boeheck Eqpt. Co. Milwaukee 3, Wis. — Mines Eng. & Eqpt. Co. San Francisco 4—Los Angeles 14

Brandeis M. & S. Louisville — Rish Eq. Co. Charleston — Rish Equipment Co. Roanoke 7 & Richmond, Va. — North Carolina Eqpt. Co. Raleigh & Charlotte, N.C. — Wilson-Weesner-Wilkinson Co. Knoxville 8 and Nashville 6, Tenn.

Telsmith Equipment

How much is a good YAK worth to you?

Native Tibetan traders regard the yak as a pretty satisfactory means of hauling.

You might pick up one of these beasts, if you shopped around, at considerably less than the price of a new truck.

But we don't think you're interested. Because, aside from the maintenance problems involved, you know that yak power would prove to be a most expensive form of transportation. Despite the "attractive" purchase price, his limited working capacity makes him a poor investment.

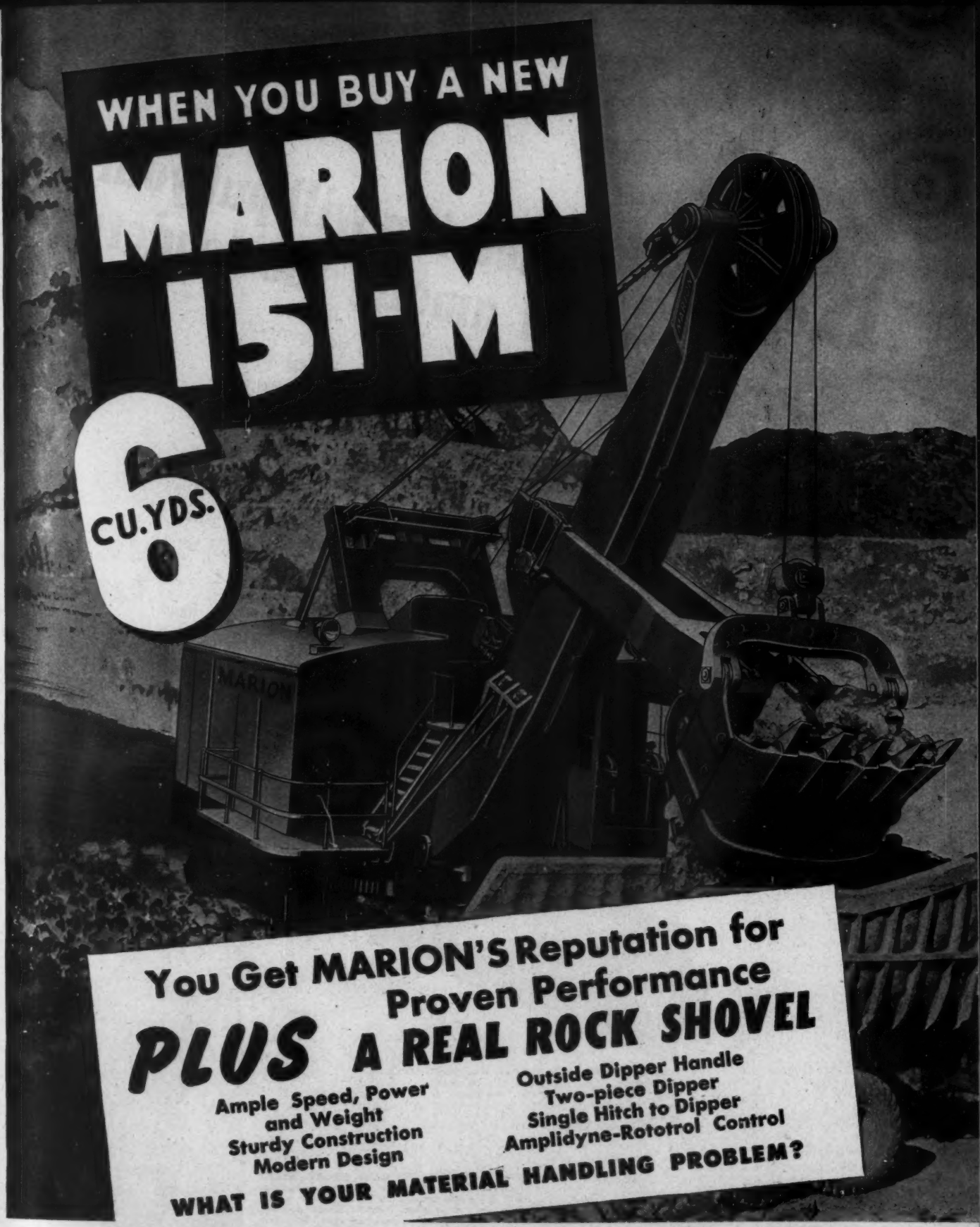
The same principle applies to trucks. Low purchase price doesn't make a bargain. The only real bargain in trucking is more work per dollar of investment—and that's where Macks excel.

Dozens of "extras" in materials and workmanship go into every Mack truck—things like case-hardened, generator-ground timing gears that *never* wear out; rubber Shock Insulators instead of ordinary spring shackles; special, heat-treated steel alloys; and a Composite Rear Axle of new design and unequalled strength. When you buy a truck that's built that way, it lasts years longer, rolls more miles, hauls more tons. That's why, though the price is a bit higher, *a Mack costs you a lot less in the end.*

Mack
TRUCKS
FOR EVERY PURPOSE

PERFORMANCE COUNTS

Mack Trucks, Inc., Empire State Building, New York, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities including Toronto and Montreal, Canada.



You Get MARION'S Reputation for Proven Performance

PLUS A REAL ROCK SHOVEL

Ample Speed, Power and Weight
Sturdy Construction
Modern Design

Outside Dipper Handle
Two-piece Dipper
Single Hitch to Dipper
Amplidyne-Rototrol Control

WHAT IS YOUR MATERIAL HANDLING PROBLEM?

MARION

POWER SHOVEL COMPANY

MARION, OHIO, U.S.A.

OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

¾ cu. yd. to 40 cu. yds.

NOTE: MARION POWER SHOVEL COMPANY — FORMERLY THE MARION STEAM SHOVEL COMPANY — *Established 1884*

Kennedy engineering will put your plant among the leaders

Into every piece of KVS equipment is built quality and performance based upon 50 years of leadership in the rock products equipment field. You, like so many other producers of sand, gravel, crushed stone, lime and cement in all parts of the world, will find that KVS machinery is built to give peak performance, not just the first year but for many years to come.

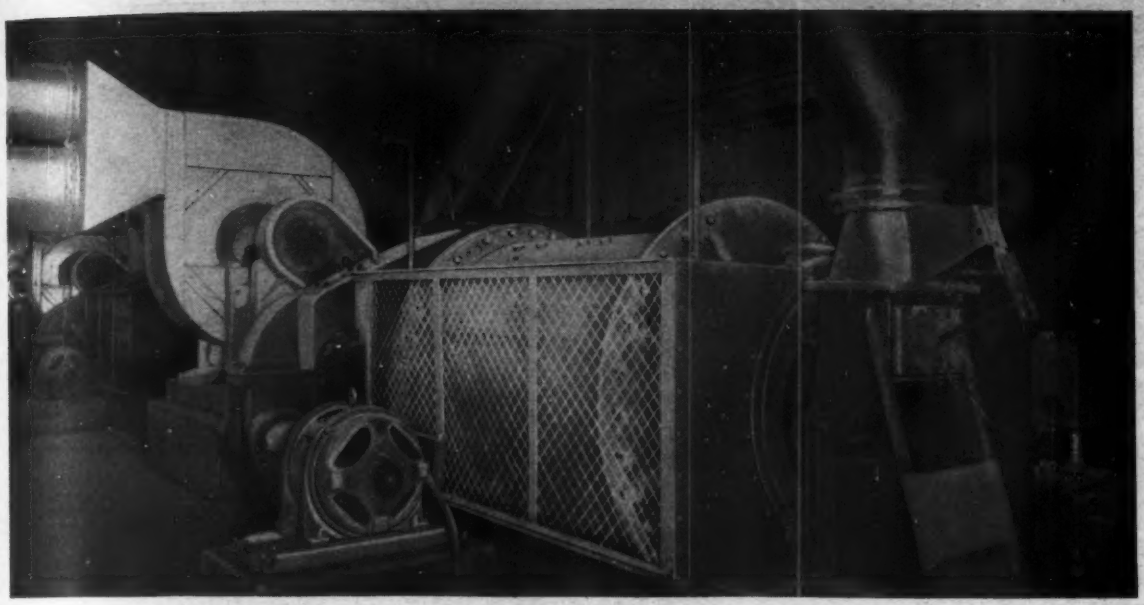
Check the superior features of this Kennedy equipment and write for descriptive catalogues and engineering information about these and other types of Kennedy machinery.

KVS SWING JAW CRUSHER for handling any kind of rock. Available in sizes to fit all output and feed requirements. Split frame construction. Heavy, unbalanced flywheels give kinetic energy and help lift pitman on upward stroke.

KVS VIBRATING SCREENS in two types, many sizes. Gives positive action on screen cloth without transmitting vibration to frame. Material is continually turned over while passing along screen to give up to 95% screening efficiency.

KVS GYRATORY GEARLESS SHORT SHAFT STANDARD CRUSHER for primary reduction. Built in motor saves 50% of power costs. Force-feed lubrication. Simple, direct, positive application of power assures long life, low maintenance costs.

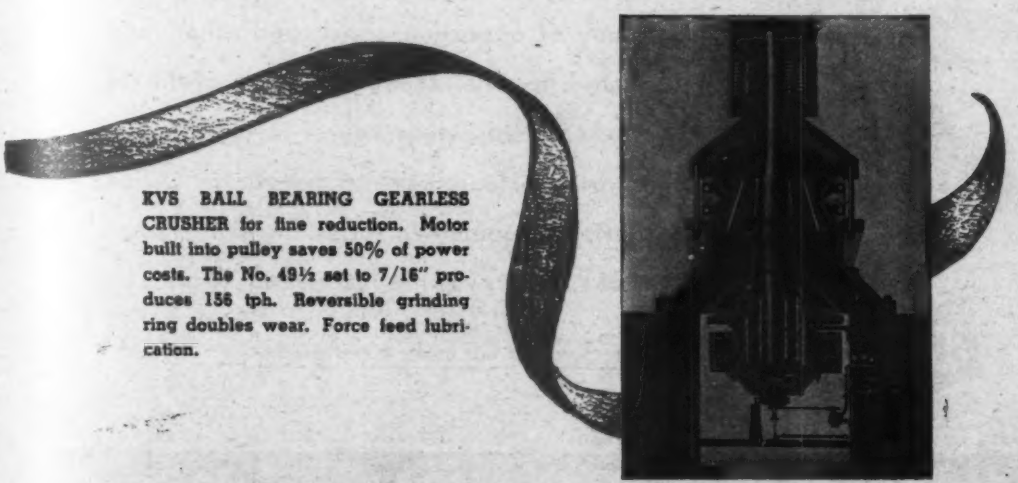
KENNEDY-VAN SAUN MFG. & ENG. CORPORATION



5,000 LB. OF PULVERIZED COAL PER HR. TO A FINENESS OF 88% TO 90% THROUGH 200 MESH ON EACH OF FOUR KENNEDY INTEGRAL GEAR DRIVEN TUBE MILLS

Part of the efficient kiln firing operations of a large Eastern cement manufacturer are four 5'x6' Kennedy Air Swept Tube Mills, one of which is shown here. Of the patented Kennedy Integral Gear-Driven type, these mills are equipped with expansion type classifiers, and receive their preheated air from the clinker cooler in order to be able to handle coal up to 18% moisture. After four years of operation this concern placed a repeat order for five additional mills to be used in other plants belonging to it.

The Kennedy Integral Gear-Driven Tube Mill is the most advanced and versatile type made today. It is being used as rod mill, and ball mill —for wet and dry grinding and for air sweeping. Its patented design enables the motor to be direct connected to the high speed shaft by double reduction herringbone gears or noiseless worm gear—a feature which greatly reduces the power required to drive the mills.



KVS BALL BEARING GEARLESS CRUSHER for fine reduction. Motor built into pulley saves 50% of power costs. The No. 49½ set to 7/16" produces 156 tph. Reversible grinding ring doubles wear. Force feed lubrication.

KVS

KILNS
COOLERS
DRYERS
CRUSHERS
HAMMERMILLS
SCREENS
FEEDERS
CONVEYORS
ELEVATORS
GRINDING MILLS
CLASSIFIERS
WASHERS
DUST COLLECTORS
AIR SEPARATORS

Write Today

for our catalog and description on these and other types of KENNEDY machinery.

2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

LET DE LAVAL HELP YOU SELECT THE *correct* WORM GEAR

Too large a worm gear is unnecessarily expensive; too small a gear invites failure. Correct selection depends not only upon transmitted horsepower and ratio of reduction but also upon continuity of operation, shock and other load characteristics. The recommendations of the De Laval representative assure you of the right drive at the right price. He is backed by Home Office engineering experience, gained in furnishing worm gear drives for all classes of service over the last twenty years.

Specifications alone do not make a worm gear

1144

TURBINES • HELICAL GEARS and WORM GEAR SPEED REDUCERS CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS and COMPRESSORS • IMO OIL PUMPS

WORM GEAR DIVISION

DE LAVAL

STEAM TURBINE COMPANY · TRENTON 2, NEW JERSEY

SALES OFFICES: ATLANTA • BOSTON • CHARLOTTE • CHICAGO • CLEVELAND • DENVER DETROIT • DULUTH • EDMONTON • GREAT FALLS • HAVANA • HELENA • HOUSTON KANSAS CITY • LOS ANGELES • MONTREAL NEW ORLEANS • NEW YORK • PHILADELPHIA PITTSBURGH • ROCHESTER • ST. PAUL • SALT LAKE CITY • SAN FRANCISCO • SEATTLE TORONTO • TULSA • VANCOUVER • WASHINGTON, D. C. • WINNIPEG

Your insurance against "hot" cement shipments

FULLER
DRY PULVERIZED-MATERIAL COOLER

Simple design.

Low power consumption.

Low maintenance cost.

Internal mechanism readily accessible.

Cooling units independent of other units in same installation. One or more units may be shut down without affecting operation.

Vertical height comparatively low, allowing for installation between mill spouts and pump hopper or collector screws, or any location where head room is limited.

Water is used as the cooling medium.

Write for Bulletin PMC-1

FULLER COMPANY, CATASAUQUA, PA.

Chicago 3 · 120 So. LaSalle St.
San Francisco 4 · 421 Chancery Bldg.
Washington 5, D. C. · 618 Colorado Bldg.

FULLER COMPANY

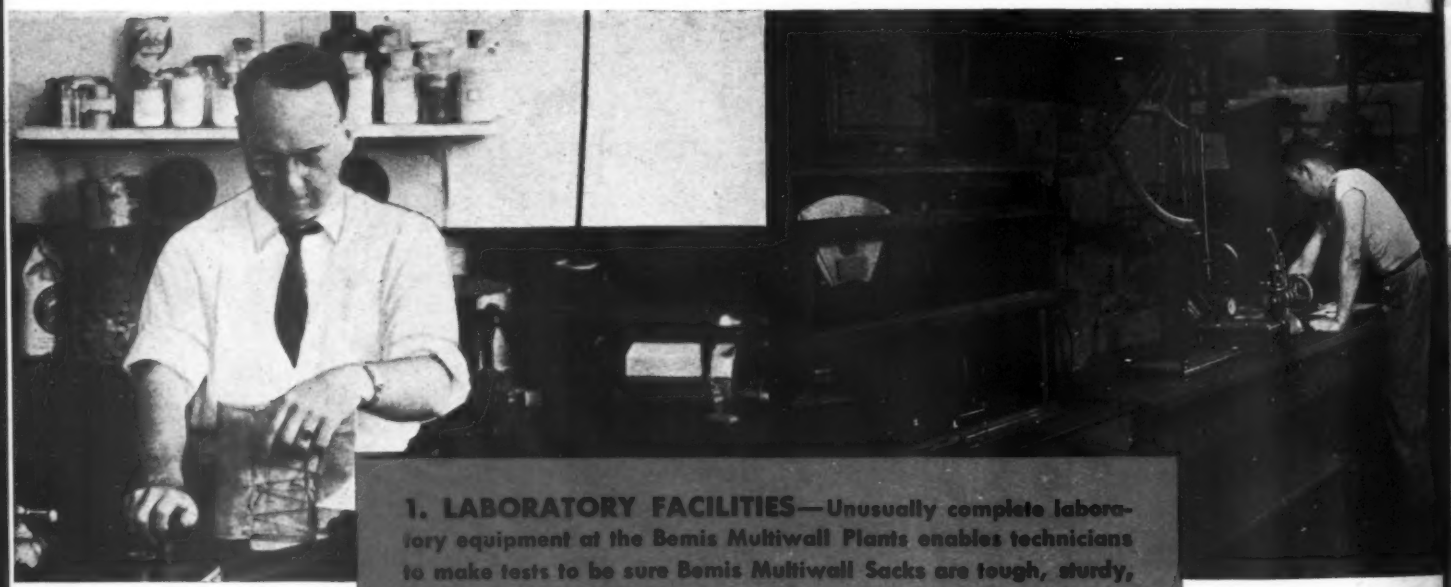
FULLER-KINYON, FULLER-FLUXO AND THE AIRVEYOR CONVEYING SYSTEMS . . . ROTARY FEEDERS AND DISCHARGE GATES . . . ROTARY AIR COMPRESSORS AND VACUUM PUMPS . . . AIR-QUENCHING INCLINED-GRATE COOLERS . . . DRY PULVERIZED-MATERIAL COOLER . . . AERATION UNITS . . . MATERIAL-LEVEL INDICATORS . . . MOTION SAFETY SWITCH . . . SLURRY VALVES . . . SAMPLERS

PMC-12

MANY MANUFACTURERS SAY...

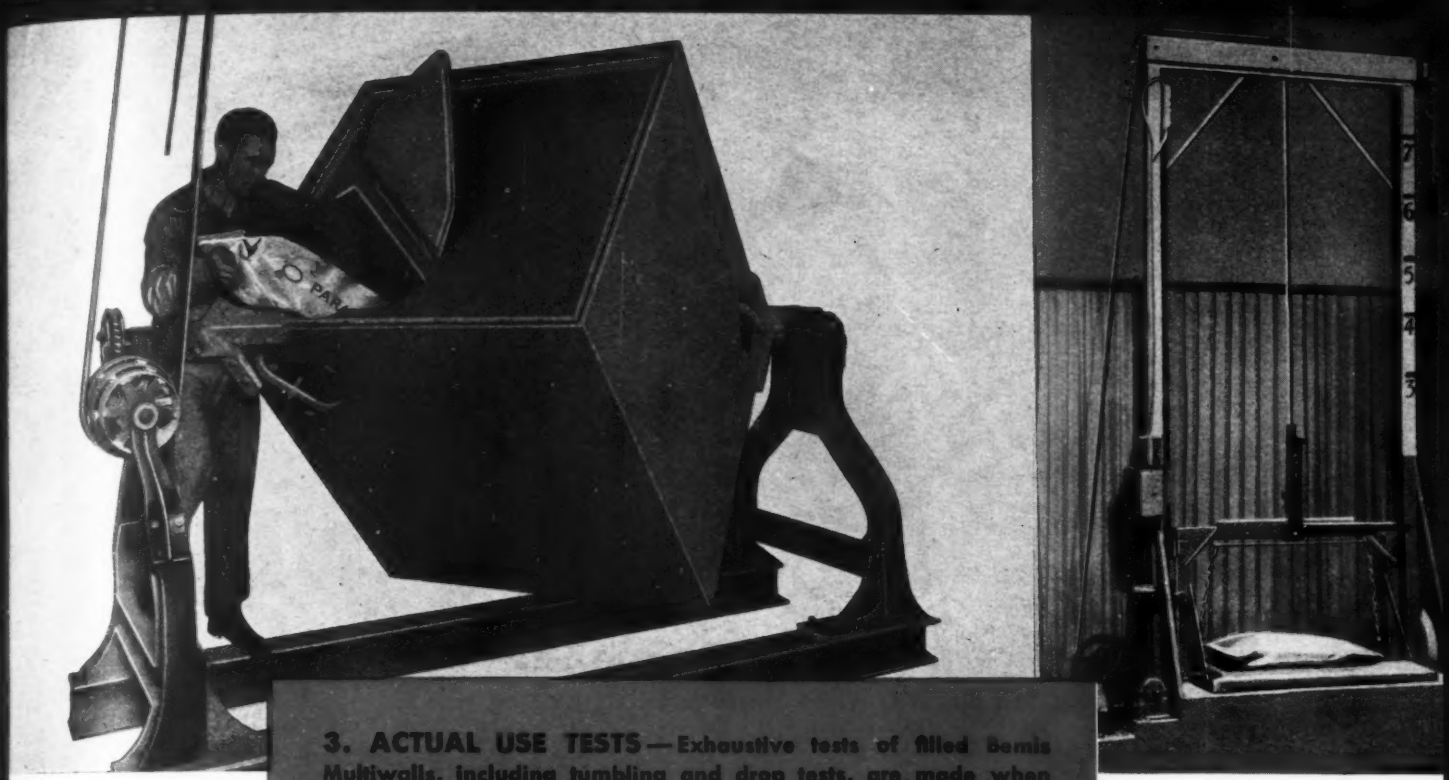
"BEMIS MULTIWALL PAPER SHIPPING SACKS are FIRST with us!"

An increasing number of manufacturers find Bemis Multiwall Paper Shipping Sacks best meet their packaging needs. Along with controlled quality, better brand printing, and packaging help offered by the Bemis Multiwall Specialists, here are four additional reasons why Bemis is preferred.



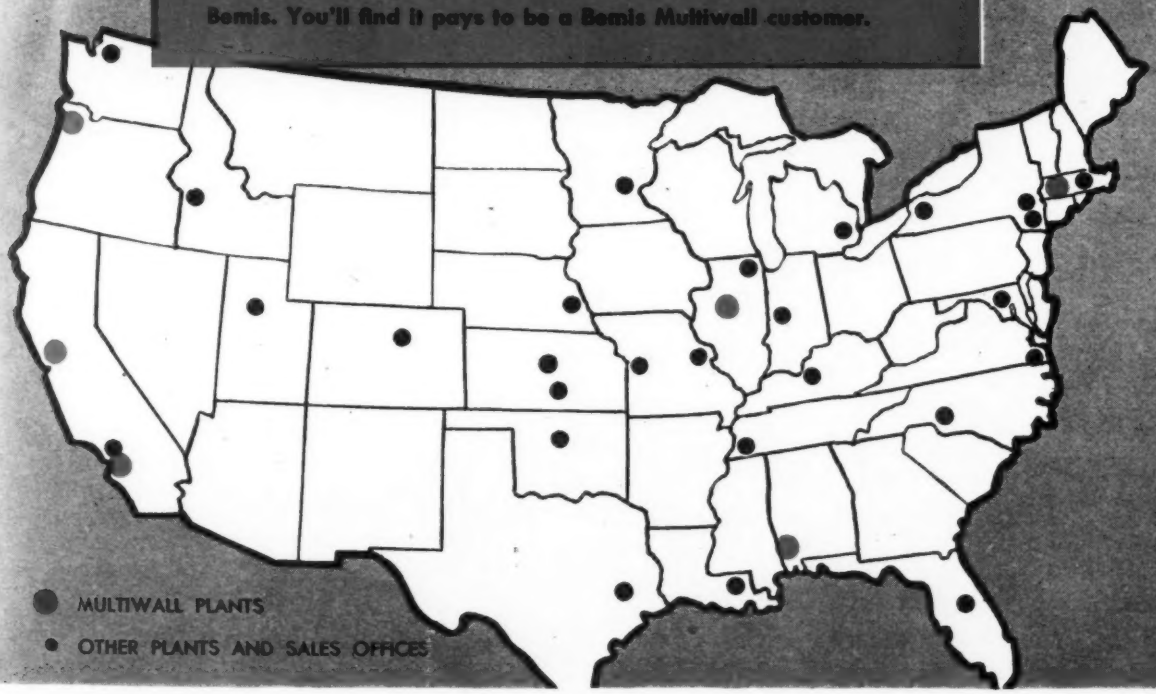
1. LABORATORY FACILITIES—Unusually complete laboratory equipment at the Bemis Multiwall Plants enables technicians to make tests to be sure Bemis Multiwall Sacks are tough, sturdy, protective containers.

2. REAL CRAFTSMANSHIP—Bemis Multiwalls are made by skilled craftsmen. To utilize their skill to the utmost, many machines used by them are especially designed by Bemis engineers.



3. ACTUAL USE TESTS — Exhaustive tests of filled Bemis Multiwalls, including tumbling and drop tests, are made when required to determine what constructions best meet specific needs.

4. SIX PLANTS — Six Bemis Multiwall Plants are strategically located north, south, east and west to facilitate delivery to your plants regardless of location. Bemis offices in 27 additional cities assure you of top-notch service. When you need Multiwalls, call Bemis. You'll find it pays to be a Bemis Multiwall customer.



BEMIS BRO. BAG CO.

Peoria, Ill. • East Pepperell, Mass. • Mobile, Ala.

San Francisco, Calif. • Wilmington, Calif. • St. Helens, Ore.

Baltimore • Boise • Boston • Brooklyn • Buffalo • Charlotte
Chicago • Denver • Detroit • Houston • Indianapolis
Kansas City • Los Angeles • Louisville • Memphis

Minneapolis • New Orleans • New York City
Norfolk • Oklahoma City • Omaha • Orlando • St.
Louis • Salina • Salt Lake City • Seattle • Wichita

Yes Sir- MY SMITH-MOBILE GIVES ME EVERYTHING I WANT!

"Why should I take unnecessary chances with UNTRIED truck mixers, when Smith-Mobile is a TRIED and PROVEN Product?"

Ready-mixed concrete operators everywhere are playing safe by using dependable, job-tested Smith-Mobile Truck Mixers and Agitators. They KNOW Smith-Mobile fills the bill. They like its many time-saving, cost-reducing features. Backed by almost a half-century of specialized mixer building experience, Smith-Mobile is now entering its 8th year of quantity production. Instead of periodically introducing "new models", Smith has always been committed to a policy of constant improvements and refinements. That's why Smith-Mobile is today the LAST WORD in truck mixer design. Get the facts! Ask for Catalog No. 198-C.

The T. L. SMITH COMPANY
2885 N. 32nd Street Milwaukee 10, Wisconsin, U. S. A.

CONTROLLED DISCHARGE

Just one of Smith-Mobile's many job-tested features. The illustration above shows a Smith-Mobile discharging directly into forms. Operator is getting just what he needs for this particular job — discharge, fast or slow, under positive control and without segregation.

SMITH-MOBILE

A 4703-1P

Rugged Bearings

FOR THE HEAVY GYRATING LOADS OF SCREENS!

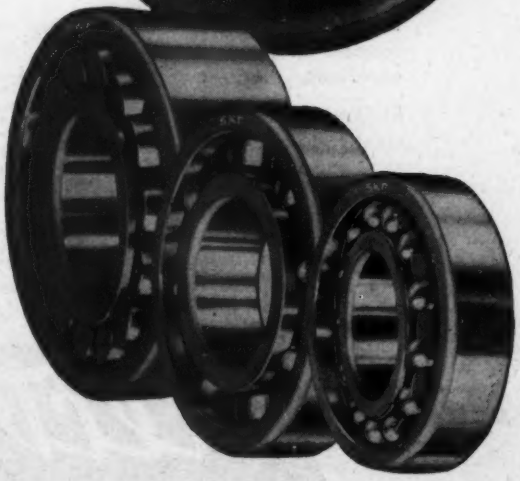
● BUILT BY THE W. S. TYLER CO.

In continuous high tonnage screening of heavy rock, crushed stone, and many other materials, bearings must withstand heavy, gyrating loads. They must unite low maintenance and high reliability with a liberal ability to endure overloads. Those are a few of the many advantages possessed by the bearings on this 6′ x 12′ Three-Deck Screen. They're SKF Spherical Roller Bearings—complete with rolling alignment to compensate for shaft deflections. When the right bearings are in the right places, they're SKF.

5985

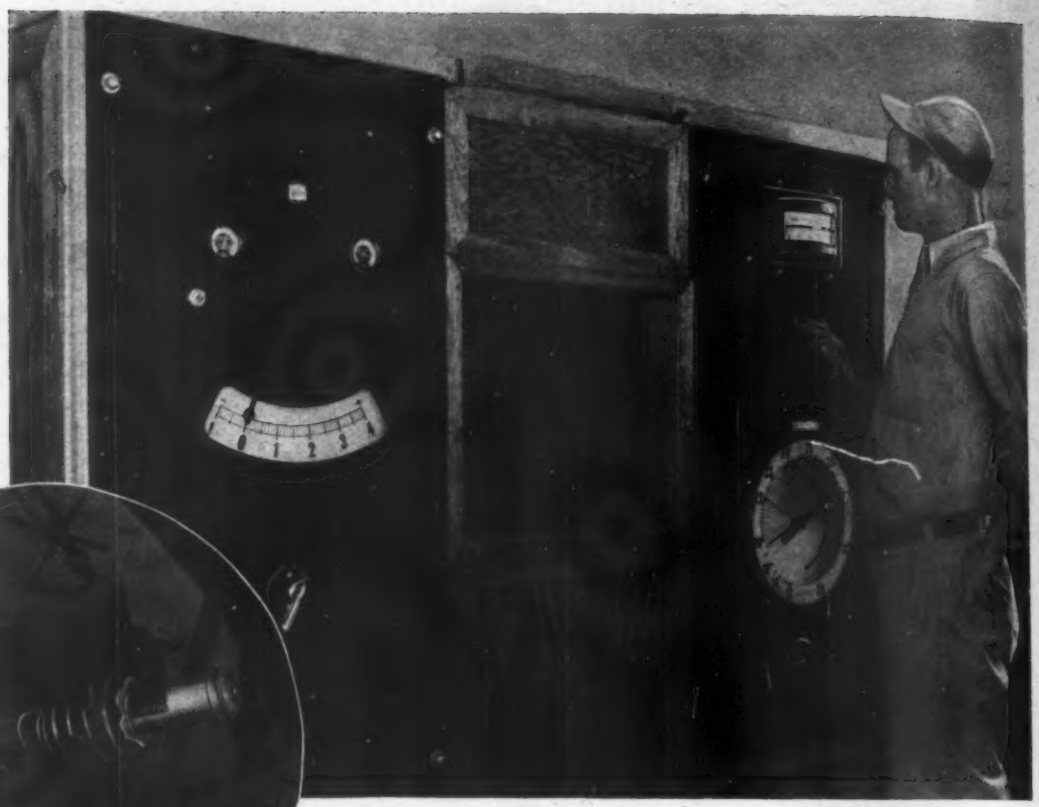
SKF INDUSTRIES, INC., PHILA. 34, PA.

SKF
Puts the Right Bearing in the Right Place



(Left) The Brown Furnace Pressure Controller and (lower right) the Brown ElectroniK Potentiometer installed on a control panel.

The Brown Radiamatic in operation on a rotary kiln.



Control of ROTARY KILN FIRING *Improves Quality*

FOREMOST requirements in firing rotary kilns are measurement and control of product discharge or kiln lining temperatures combined with automatic kiln pressure control. Quality of product, refractory life and fuel economy are directly related to and controlled by temperature conditions.

BROWN ELECTRONIK, indicating, recording or control Potentiometer, provides maximum accuracy of temperature indication and control. Operating on the *"Continuous Balance"* principle, its response to temperature changes is practically instantaneous. Freedom from moving parts assures long life and continuous service under the abrasive dust conditions found in cement and other rock product plants.

BROWN RADIAMATIC, operating on the radiation pyrometer principle, provides accurate measurement of temperature conditions. Its design insures freedom from effects of high ambient temperatures. Accuracy is unaffected by dust and dirt.

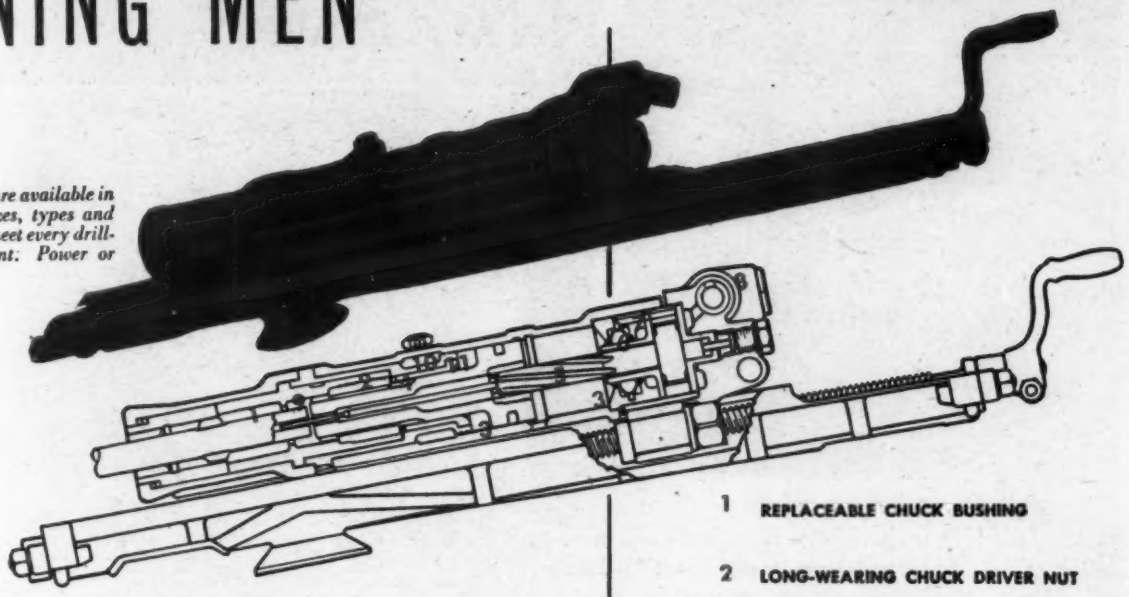
BROWN FURNACE PRESSURE CONTROLLER, Pneumatic Pressure Control System, maintains constant furnace pressure automatically. Operating on the famous Brown Air-o-Line principle, its accuracy and sensitivity provide maximum operating efficiency.

Write for Catalogs No. 5102, No. 15-9 and No. 74-2 describing these advanced instruments and controls in detail. THE BROWN INSTRUMENT COMPANY, a division of Minneapolis-Honeywell Regulator Company, 4444 Wayne Ave., Philadelphia 44, Pa. Offices in all principal cities. Toronto, Canada—London, England—Stockholm, Sweden—Amsterdam, Holland.

BROWN *Electronik* POTENTIOMETERS

WHY LEADING MINING MEN *specify* Thor DRIFTERS

Thor Drifters are available in a range of sizes, types and mountings to meet every drilling requirement. Power or Hand Feed.



1 REPLACEABLE CHUCK BUSHING

2 LONG-WEARING CHUCK DRIVER NUT

3 FULL AIR CUSHIONING

4 REPLACEABLE FRONT HAMMER BUSHING

5 EXTRA-HEAVY RIFLE BAR

6 SELECTIVE ROTATION SPEEDS

7 LIGHT-WEIGHT, SHORT-TRAVEL VALVE

8 POSITIVE THROTTLE CONTROL

9 EXCEPTIONAL HOLE CLEANING ABILITY

10 CONSTANT, AUTOMATIC LUBRICATION

11 PNEUMATIC PACKING

EXTRA FEATURES like these Reduce Maintenance and Cut Costs while assuring Peak Performance

LOOK at the outstanding design and construction features of this Thor Drifter Rock Drill. To the experienced operator, they spell drilling ability that means more "*bonus rods*" and to the Drill Doctor they spell new records in low-cost operation.

Built with the experience of fifty years of air tool making, Thor Rock Drills have *proved* their ability to increase footage in every kind of formation . . . and show amazing economy at the same time. Before you buy another rock drill, have *your* Drill Doctor check these Thor advantages. Then try a Thor on your property to see how it saves you time and money.

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Boulevard, Chicago 6, Illinois
BIRMINGHAM BOSTON BUFFALO CLEVELAND DETROIT LOS ANGELES MILWAUKEE NEW YORK
PHILADELPHIA PITTSBURGH ST. LOUIS SALT LAKE CITY SAN FRANCISCO TORONTO, CANADA LONDON, ENGLAND

. . . Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

"Here's Plain Primacord, the perfect detonating agent for shallow holes and surface trunk lines. Its light weight makes it easy to handle in the field — cuts loading and hooking-up time. You're never asking for trouble from stray electric currents when you use Primacord because no cap is ever attached until just before the blast."

"Now look at Reinforced Primacord. It's designed especially for deep, ragged holes where you need extra tensile strength and resistance to abrasion. You can shoot an unlimited number of holes at one time with Primacord. Yet you never risk having unexploded caps in the rock pile because no cap ever goes into the hole."

"You'll want to use Wire Countered Primacord where the going is really tough. Its brass wire binding, covered with wax coated cotton yarn, makes it perfect when you need top resistance to abrasion. And with Primacord on the job you can forget the dangers of stray currents from electrically operated equipment."

All three types of Primacord-Bickford Detonating Fuse incorporate a built-in time delay feature that makes for efficient shot sequence. All offer the same easy means of hooking-up with square knots and half hitches. There's no mystery about Primacord efficiency. It's plain, proved fact — backed by years of acceptance by pit and quarry men the nation over.

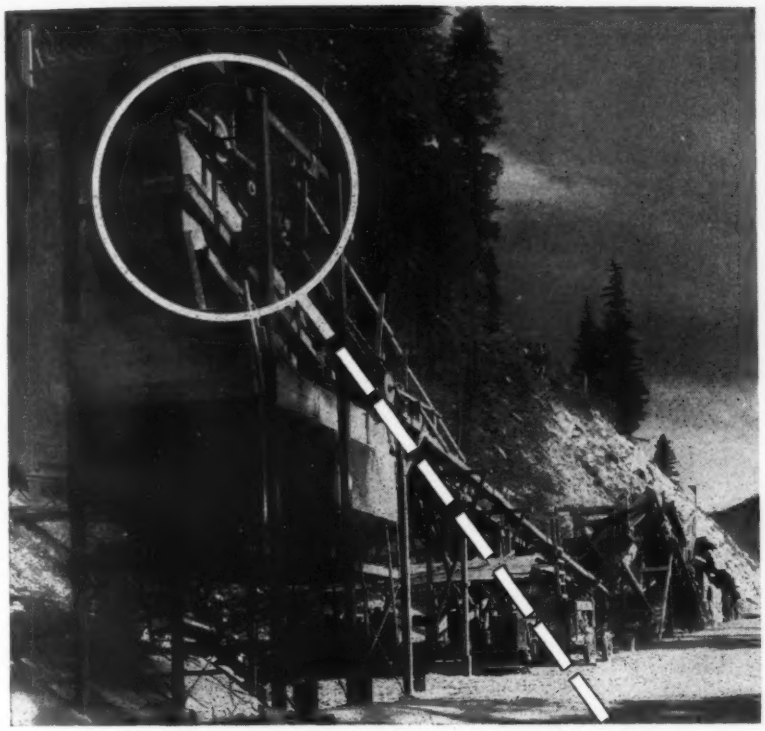
Also
ENSIGN-BICKFORD SAFETY FUSE
Since 1836

THE ENSIGN-BICKFORD COMPANY • Simsbury, Connecticut

P-10

PRIMACORD-BICKFORD Detonating • Fuse •

"MORE PRODUCTION WITH SIMPLICITY SCREENS"



Simplicity screen in action at Washington Stone plant

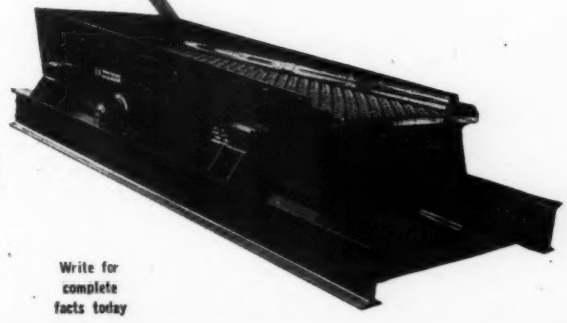
Says one western producer: "It's hard to believe but we are getting 50% more capacity from our plant with only one change of equipment. Our old screening units were replaced with Simplicity Gyrating Screens of the same size.

From far corners of the world, Canada, Mexico, Alaska and many foreign lands and from every section of the nation come reports of Simplicity Gyrating Screens setting new production records.

That means not only maximum production but clean, accurately-sized materials produced with low power requirements and a minimum of maintenance.

These built-in features explain why:

1. **Concentrated Screening Force—The counterbalance is machined directly on the eccentric shaft located between the sideplates and squarely under the load.**
2. **Screen Cloth Whip eliminated by stretching cloth taut all four ways.**
3. **Adjustable Angle. Setting may be changed as much as 10 degrees by a simple corner adjustment which does not shift I-beams.**
4. **Heavy-Duty Bearings are set in dust-proof water-proof housings protected by special labyrinth bronze seals.**
5. **Rubber-Cushioned Power. Resilient rubber corner supports are used so that all positive gyrating action is imparted to screen decks, and not into the supporting structure.**
6. **Durable Construction — Heavy I-beam frame is tied together with rigid steel channels. Sturdy steel construction permits larger capacity with minimum repairs.**



Write for complete facts today

Simplicity

TRADE MARK REGISTERED

ENGINEERING COMPANY

DURAND, MICHIGAN

Generally Speaking

May 1, 1946

Dear Reader:

Engineering construction for the first 13 weeks of 1946 totaled $980,283,000, 158 per cent over the total for the same period of 1945, with private building running 576 per cent ahead of a year ago. It will be interesting to observe the effect of the recent construction freeze, on a program that was gaining such satisfactory progress.

* * * * * * * * * * *

An employer cannot be barred from seeking excess profits tax relief for a dissolved corporation just because State legislation limits the life of such corporation to three years after dissolution. Directors may seek relief under the Internal Revenue Code.

* * * * * * * * * * *

Test experience of the wear resistance of neoprene under service has been made available to du Pont, supplier of crude neoprene to manufacturers of rubber products, from the record of a conveyor belt in 18 months' service handling slate, rock, shale, etc., from a bituminous coal mine. This neoprene belt has transported 225,000 tons of material and, judging from the fact that the carcass shows very little wear, will give indefinite service, according to the user.

* * * * * * * * * * *

The anorthosite treatment in the 50-ton per day plant of Monolith Portland Midwest Co. at Laramie, Wyo., is still in the speculative stage. The process was developed to obtain as residue a raw material suitable for manufacture of high silica, low alumina cement.

* * * * * * * * * * *

Quick-lime is one of the constituents of "Excelite", a structural material, made by Research for Industry, Inc., that is designed as a substitute for metals and plastics. The material may be used in insulating building boards, doors, gutters, air ducts, roofing and many other products.

* * * * * * * * * * *

Bureau of Reclamation has called for bids for the construction of South Coulee dam, to be started this summer. Some 1,500,000 cu. yd. of earth and rock fill will be required for construction of the structure which will have a height of 60 ft. and a crest length of 10,000 ft. South Coulee dam with North Coulee dam, to be built later, will form barriers 27 miles apart at the ends of Grand Coulee, on the Columbia river in Washington State, to create an equalizing reservoir.

* * * * * * * * * * *

Congress has been asked for $3,790,400 to begin road improvements in territorial Alaska, of which $2,300,000 would be spent for new roads to open up agricultural regions. A 3-year program, comprising 407 miles of new routes at a cost of over nine million dollars, is contemplated.

* * * * * * * * * * *

Wyoming bentonites and related clays are under study at the Natural Resources Research Institute of the University of Wyoming with the object of evaluating them for their best uses and possibly developing new outlets.

* * * * * * * * * * *

(Continued on page 37)

BALLMILLS

WET OR DRY GRINDING

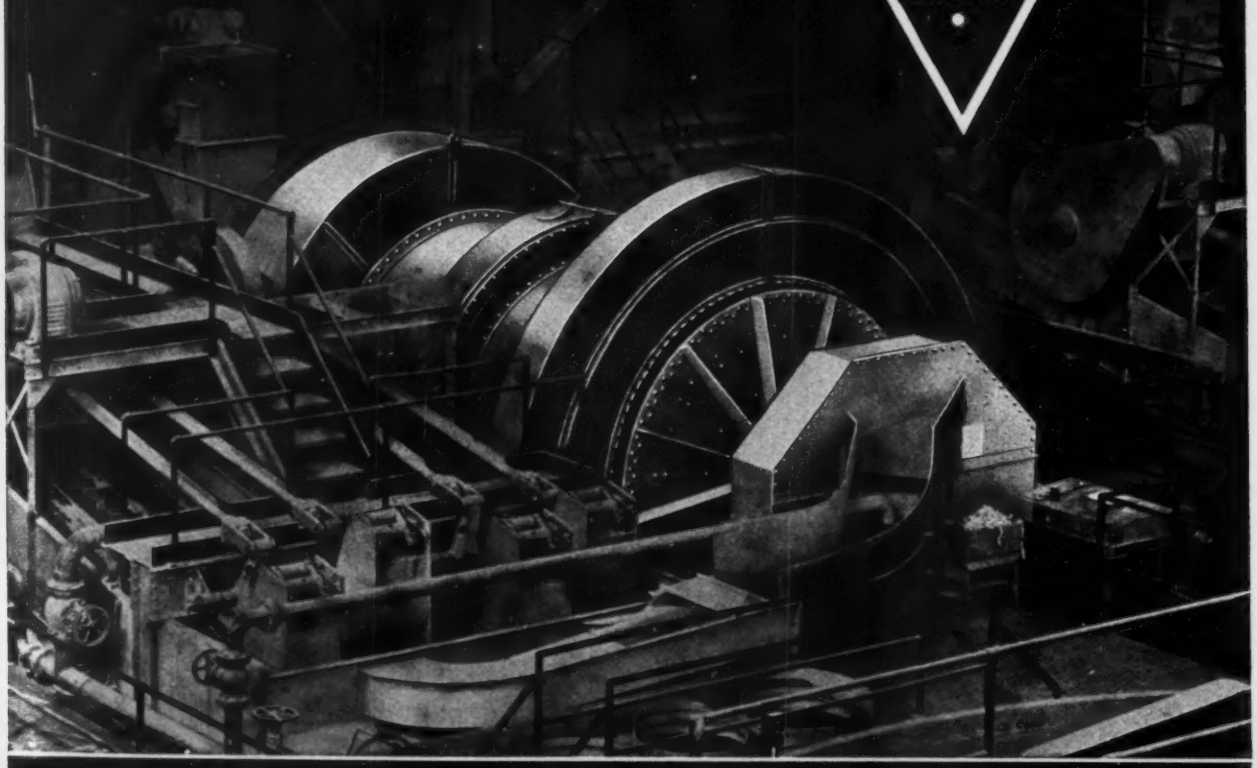
•

OPEN OR CLOSED CIRCUIT

•

ALSO AIR SWEPT FOR GRINDING AND DRYING

•



F. L. SMIDTH & CO.

11 WEST 42ND STREET

ENGINEERS
MANUFACTURERS OF BALLMILLS
SINCE 1895

NEW YORK, N. Y.

Ryerson Stocks Equally Handy

Steel of all kinds at your finger tips, almost as convenient as the seasonings on a well stocked shelf! The right kind, the exact amount, in easy reach.

That in substance is Ryerson Steel-Service, supplied by eleven strategically located Ryerson plants. The exact steel you want, cut or otherwise prepared just the way you want it, delivered promptly, "right from the shelf."

Even now, with stocks short in many sizes, you can more often find the steel you need at Ryerson. And stocks are improving daily.

Moreover, Ryerson technical men are available to work with you on any problem of selection or fabrication.

Ryerson stocks normally include more than 10,000 sizes, shapes and kinds of steel, all described in the current Ryerson Stock List and Data Book. Copies have been distributed, but if you do not have one we will be pleased to send it to you.

No matter what kind of steel you need, contact Ryerson *first*—your best source for prompt steel delivery.

PRINCIPAL PRODUCTS

- Bars—
  - hot and cold rolled
  - alloy steel
  - reinforcing
- Structurals
- Plates—
  - Inland 4-Way Floor Plate
- Sheets
- Strip Steel
- Mechanical Tubing
- Boiler Tubes and Fittings
- Allegheny Stainless—
  - sheets, plates, shapes, bars, tubing, etc.
- Tool Steel
- Wire, Chain
- Bolts, Rivets
- Babbitt
- Solder
- Welding Rod
- Metal Working Tools and Machinery, etc.

JOSEPH T. RYERSON & SON, INC.

Steel-Service Plants at: Chicago • Milwaukee • Cleveland • Cincinnati • St. Louis • Detroit Philadelphia • Pittsburgh • Buffalo • Boston • New York

RYERSON STEEL

GENERALLY SPEAKING

(Continued from page 34)

Michigan has had to resort to cost-plus-fixed-fee contracts instead of the standard fixed cost award in order to get necessary building underway. A contractor is undertaking a dormitory project at Michigan State College on the cost-plus basis, with the agreement that the State will pay him a 25 per cent bonus if he can cut the cost below the estimate.

* * * * * * * * * * *

Federal Trade Commission has made recommendations to Phosphate Export Association that it withdraw from and rescind certain cartel agreements with foreign producers of phosphate requiring it to be responsible in its quotas for all exports from this country, including exports by non-members. Producers of Florida land pebble phosphate are members of the Association.

* * * * * * * * * * *

Lime industry was saluted recently on the Valley Forge Caravan over station KYW in one of a series of tributes to American industry. The part that lime plays in our civilization and production for quality of product were emphasized in the broadcast.

* * * * * * * * * * *

Mexico is making the biggest investment in road building and reconstruction in any one year during 1946, with a program to cost 160 million pesos. Emphasis will be on roads that will contribute to national industrialization, the development of agriculture and stimulation of tourist traffic.

* * * * * * * * * * *

The emergency housing program, calling for construction of 2,700,000 medium and low-priced dwellings by the end of 1947, would represent an estimated aggregate investment of 11 1/3 billion dollars.

* * * * * * * * * * *

Synthetic mica, as developed in the laboratories of KWI Ceramics Institute in Germany, is a product which U. S. investigators claim to be as good as natural mica. The synthetic mica consists of mixed oxides, fluorides and silico-fluorides containing certain metals. Means for producing larger blocks of mica consist generally in careful control over cooling of the melt and introduction of a magnetic field at right angles to the vertical axis of the crucibles used.

* * * * * * * * * * *

An employer must include a regularly-paid bonus as part of his employes' basic rate of pay for purpose of calculating overtime pay under the Fair Labor Standards Act. It has been decided that such bonuses are part of the regular rate of pay, even if no contract requires such payment.

* * * * * * * * * * *

Highway construction costs continue high. The lowest bid received for construction of a section of heavy main highway between Alexandria and Monroe, in Louisiana, ran approximately $108,000 per mile compared with a prewar normal cost of about $70,000.

* * * * * * * * * * *

Establishment of an urban redevelopment unit within the Federal Housing Administration to develop means of F.H.A. participation in the rehabalitation of American cities has been announced. Long-range, overall redevelopment planning is to be emphasized, and the redevelopment of blighted and slum areas.

* * * * * * * * * * *

THE EDITORS

now you can make money on the smaller black top jobs, too!

the Cedarapids PATCHMASTER

Continuous Mixing

Portable . . . Stationary . . . Low Cost

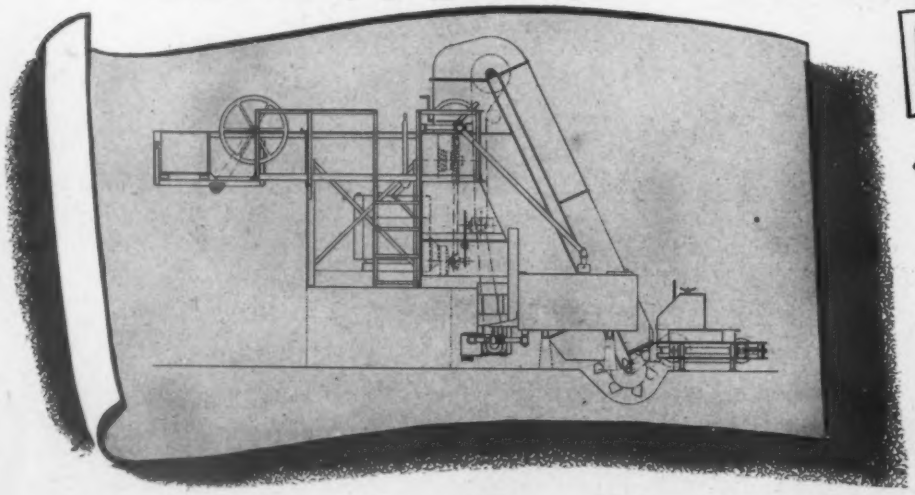
HERE'S the asphalt mixing plant that will really put money into your pockets on all small and medium sized jobs. 25 to 30 tons an hour—150 to 250 tons per day—of uniform, thoroughly coated and mixed aggregate are a cinch for the Patchmaster. Set it up as a permanent plant wherever you have a regular demand for patching material. Keep it on pneumatics if your jobs are widely scattered. Either way you'll find it is the handiest, most profitable maintenance plant you ever saw. You'll be amazed at its accuracy, economy and high capacity. By adding a drier you can handle hot mixes as well.

Ground-level charging hopper assures quick, easy loading. Truck-high pug mill discharge eliminates troublesome delivery conveyor belts. Every part is built to Cedarapids high quality standards for long life, trouble-free operation and low cost.

The Patchmaster is the ideal plant for contractors, townships, counties, cities, state highway departments, large industrial plants or anyone who wants a low-cost, low-priced asphalt mixing plant for their smaller black top jobs. See your nearest Cedarapids distributor or write for Bulletin PM-1.

IOWA MANUFACTURING CO.

Cedar Rapids, Iowa, U.S.A.



Cedarapids

Built by IOWA

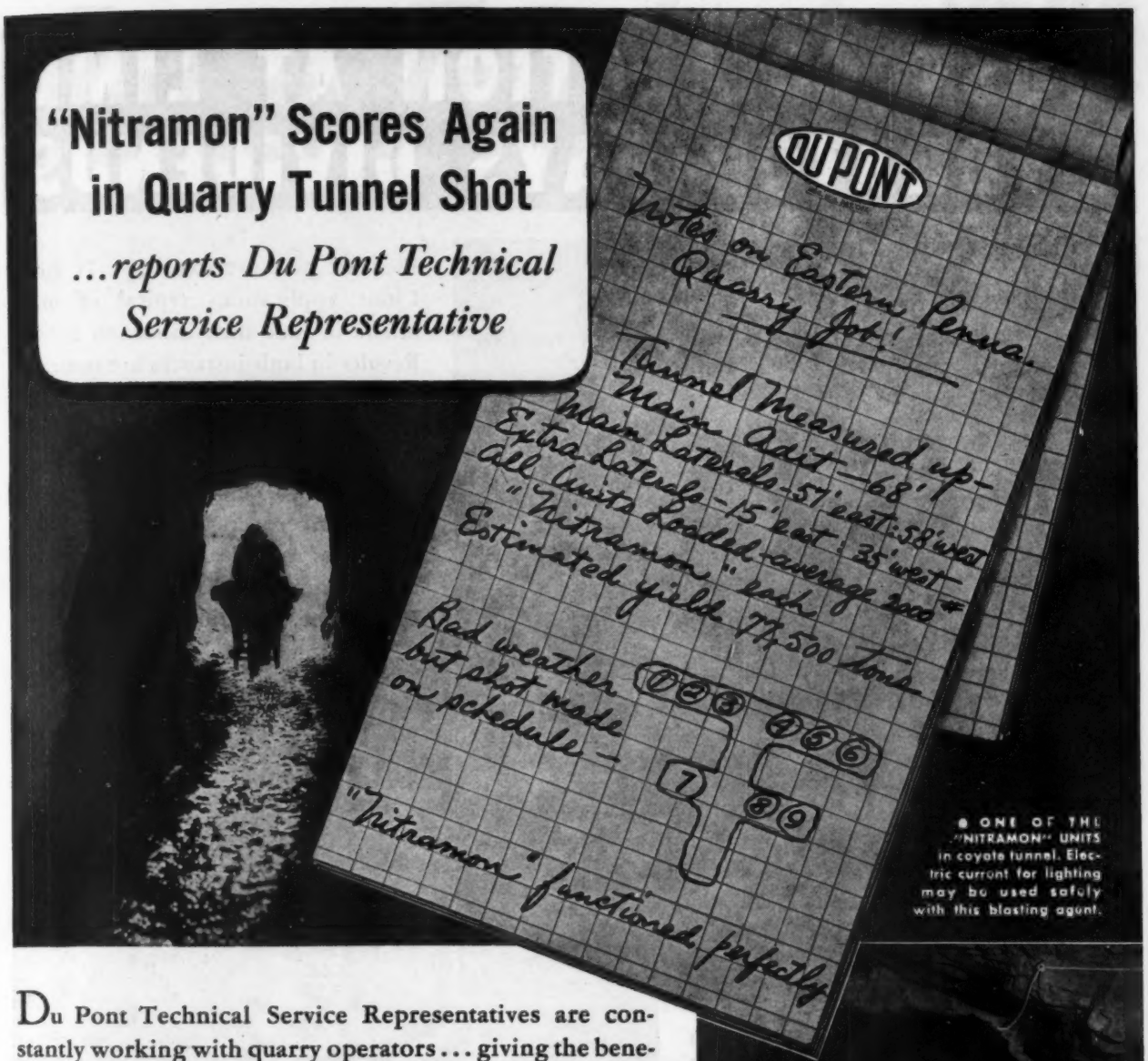
THE IOWA LINE

of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS—TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

"Nitramon" Scores Again in Quarry Tunnel Shot

...reports Du Pont Technical Service Representative


DU PONT
Notes on Eastern Penna. Quarry Job!
Tunnel Measured up—
Main Adit—68'
Main Laterals-57' east: 58' west
Extra Laterals-15' east: 35' west
All Units Loaded-average 200 #
"Nitramon" each
Estimated yield 77,500 tons
Bad weather but shot made on schedule—
"Nitramons" functioned perfectly

● ONE OF THE "NITRAMON" UNITS in coyote tunnel. Electric current for lighting may be used safely with this blasting agent.

Du Pont Technical Service Representatives are constantly working with quarry operators... giving the benefit of their wide experience in blasting. The "Nitramon" shot outlined here is a typical example.

"Nitramon" is easier and safer to use. It cannot be detonated by the strongest caps, open flame, friction, falling objects or impact of rifle bullets. But a combination of "Primacord" and "Nitramon" Primer readily detonates it. If you have a blasting problem, discuss "Nitramon" with a Du Pont Technical Service Representative.

E. I. DU PONT DE NEMOURS & CO. (INC.)
EXPLOSIVES DEPARTMENT • WILMINGTON 98, DELAWARE

DU PONT "NITRAMON"

DU PONT
REG. U. S. PAT. OFF.

A Product of Du Pont Explosives Research

BETTER THINGS FOR BETTER LIVING ... *THROUGH CHEMISTRY*

DUST COLLECTION AT LIME HYDRATOR PAYS DIVIDENDS

Pictured here are two Type N Roto-Clone applications typical of many others in lime dust collection service. Results in both instances are outstanding from the standpoints of efficiency in operation and savings of material ordinarily lost in process. The Roto-Clone shown below, serving a Clyde Hydrator, recovers 1½ tons of lime per day, saves roof cleaning and neighborhood complaints. Send for Type N Roto-Clone Bulletin No. 277.

Not only does the Roto-Clone remove all dust from the vented steam and air, but the lime slurry resulting from the cleaning operation is salvaged and piped to the hydrating pan *automatically and continuously.* The Roto-Clone does this remarkable job without cost because the savings not only pay for the current used but will also, in time, "write off" the original cost of the installation.

The Type N Roto-Clone cleans by means of a water curtain induced by the flow of air. There are no moving parts or narrow passages to be obstructed by lime dust deposits. Capacities—1,000 to 25,000 cfm.

AMERICAN AIR FILTER COMPANY, INC.
Incorporated
107 Central Ave., Louisville 8, Ky.
In Canada: Darling Bros., Ltd., Montreal, P. Q.
Roto-Clone is a registered trade-mark for a dynamic precipitator or hydrostatic baffle-type wet collector.

ROTO-CLONE
FOR ROCK PRODUCT DUST CONTROL

Better Trucks for YOUR Business!

"OUR 9 FORDS HAUL OVERLOADS OF LIME AT LEAST COST, WITH MOST RELIABILITY"

"For the past 24 years, we've been using Ford products," writes Mr. E. G. Christianson, of the firm of E. G. & Leo Christianson, La Crosse, Wisconsin. *"The photograph shows one of our nine Ford dump units loading up with six yards of limestone. Others haul five yards of gravel or crushed rock six days a week.*

"We're certainly thankful we've had Ford Trucks during this past emergency, because they're rugged and reliable, and service has been excellent. Our Fords have run without interruption.

"We operated one new truck of another make along with our present Fords for two years, and our records show that maintenance cost on this unit was far higher."

The ability of Ford dump trucks to stand up and perform with true economy under service of this kind has been proved by hundreds of haulers of bulk building materials and other quarry and mine products. Ford V-8 or 6-cylinder engine power and torque, and the time-proved strength and load-capacity of the Ford rear axle, are assets appreciated by every operator who does heavy hauling. See your Ford Dealer NOW!

Ford

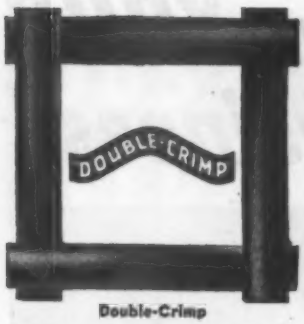
FORD ADVANCED ENGINEERING!

THE FAMOUS V-8 ENGINE, for toughest service, now 100 HP, with NEW steel-cored Silvaloy rod bearings for trebled endurance • NEW Flightlight aluminum alloy 4-ring pistons for added oil economy • Tougher, rust-proofed valve springs • NEW moisture-sealed distributor • NEW coolant-saving radiator closure • Auto-balanced carburetion for still more thrifty power • Servicing simplified still further. And the rugged, thrifty 90 HP Ford six-cylinder engine, for stop-and-go jobs, with many important advancements, available in all except C.O.E. chassis.

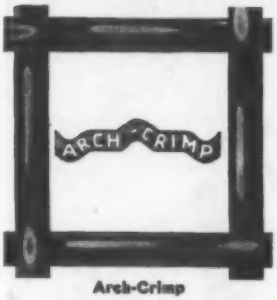
Ford Truck rear axles—world-famous for load-lugging—provide generous reserve capacity • Light duty chassis have sturdy ¾-floating axle with triple-roller-bearing, straddle-mounted pinion; full-floating axles in all other chassis • 2-speed axle at extra cost in heavy duty units • Improved 4-speed transmission at extra cost in light duty chassis, standard in all others.

FORD TRUCKS

MORE FORD TRUCKS ON THE ROAD • ON MORE JOBS • FOR MORE GOOD REASONS

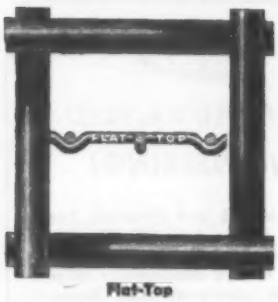


Double-Crimp



Arch-Crimp

Intermediate-Crimp



Flat-Top

"The Perfect"

Wire Cloths and Screens

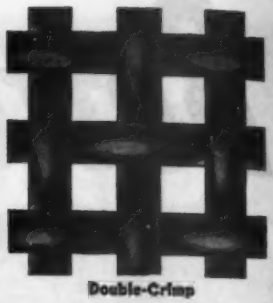
We have been specialists for many years in the making of precision wire cloths, wire screens and woven wire products.

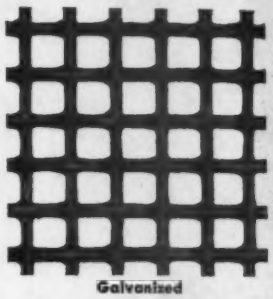
We apply our same precision principles in fabricating wire cloths into finished industrial units, for production or processing equipments or for permanent parts of countless industrial products.

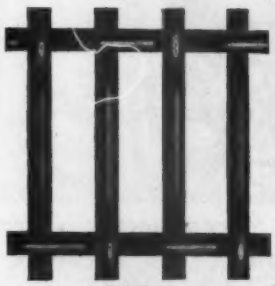
We invite your inquiries for wire cloths of all commercial metals or alloys or weaves, in continuous lengths or cut to size, or processed to meet your individual requirements.

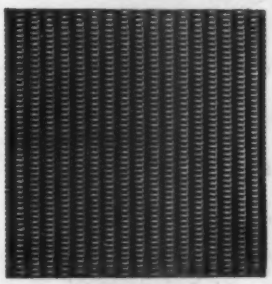
"Perfect" alloys and metals	"Perfect" Wire Cloth weaves	"Perfect" Wire Cloth processing	"Perfect" Wire Cloth products
Super-Loy	Arch-Crimp	Bending	Baskets
Steel	Coiled	Binding	Circles
Galvanized	Double-Crimp	Brazing	Cones
Tinned	Double-Fill	Calendering	Crates
Stainless Steel	Dutch	Clinching	Cylinders
Nickel-Chromium Alloys	Filter	Cutting	Discs
Aluminum	Flat-Top	Dipping	Forms
Brass	Herringbone-Twill	Dishing	Leaves
Bronze	Intermediate-Crimp	Flanging	Lengths
Commercial Phosphor	Rek-Tang	Flattening	Panels
Copper	Selvage-Edge	Forming	Pieces
Monel Metal	Straight-Warp	Framing	Racks
Nickel	Stranded	Galvanizing	Ribbons
Any special alloys available in rod or wire form	Sta-Tru	Painting	Rolls
	Triple-Warp	Shearing	Sections
	Twilled	Slitting	Segments
	Twisted-Fill	Trimming	Spacers
	Twisted-Warp	Arc-Welding	Strips
		Gas-Welding	Template shapes
		Spot-Welding	Trays

We will follow your specifications and blue-prints exactly as your production engineers have prepared them—or we will submit suggestions for your approval.


Double-Crimp


Galvanized


Rek-Tang


Dutch Weave

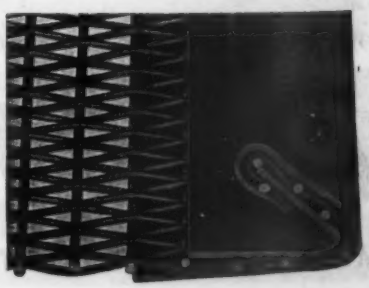
The LUDLOW-SAYLOR WIRE COMPANY

Newstead Avenue & Wabash Railroad

ST. LOUIS 10, MO.

LUDLOW-SAYLOR PRECISION FABRICATING makes vibrating-screen decks and jackets that are easily handled—quickly installed—need fewer adjustments and renewals.

Illustrations suggest only a few of the many available types of wire cloth and woven wire screens, which may be custom-finished with attachments to fit your particular processing installations.



REPUBLIC *Hands* YOU THIS CONVEYOR BELT ECONOMY

Republic has constantly expanded plant facilities to keep pace with ever-increasing conveyor belt demands from the aggregate industry. As a result, a large segment of the huge Republic plant today houses modern belt production equipment. Despite this, the long-lived economy for which Republic Conveyor Belting is noted is still a hand proposition. Republic belt builders, master craftsmen in their trade, still put together fabrics by hand so the belt will run true, still use their personal handiwork and care in location of seams, sealing-in of the reinforcing carcass for protection against moisture, other manufacturing steps where human skill means quality. This painstaking production is the source of superior service with Republic Conveyor Belting... a source which hands you added belt economy. Consult your nearby Republic Distributor.

REPUBLIC RUBBER

DIVISION

LEE RUBBER & TIRE CORPORATION

YOUNGSTOWN 1, OHIO

REPUBLIC INDUSTRIAL PRODUCTS
YOUNGSTOWN, O

LEE DELUXE TIRES AND TUBES
CONSHOHOCKEN, PA

WE ARE PARTICIPANTS IN THE OWNERSHIP AND OPERATION OF NATIONAL SYNTHETIC RUBBER CORPORATION

MANGA-TONE N.M. Does It

Instructor directing welding operator in the art of "Two-Tone" welding. Note that a filler rod held in the left hand is fed into the arc. This large crusher jaw was built up to a depth of nine inches over a width 26 inches and a length of 72 inches. Total metal added exceeded 4000 lbs. consisting of

¾ Ton of Manga-Tone N.M. filler bars
¾ Ton of A.W.S. 6010 Electrodes
½ Ton of Nickel-Manganese Applicator bars
300 Lbs. of Flintype V.H. wear-resisting alloy

Nickel-manganese applicator bars were cut 24 inches long and tack-welded on three inch centers, space between being filled with Manga-Tone N.M. special nickel-manganese filler bars applied by the "Two-Tone" process with A.W.S. 6010 Electrodes. Then another layer of 72 inch nickel-manganese filler bars was applied lengthwise spaced three inch centers, and spaces again filled by the "Two-Tone" process using Manga-Tone and A.W.S. 6010 electrode. Procedure was repeated until the full nine inch depth of wear was completely filled in with a re-inforced mesh of nickel-manganese steel and weld metal. Two final criss-cross passes of Flintype V.H. 5/16 inch electrodes were applied for greater wear resistance.

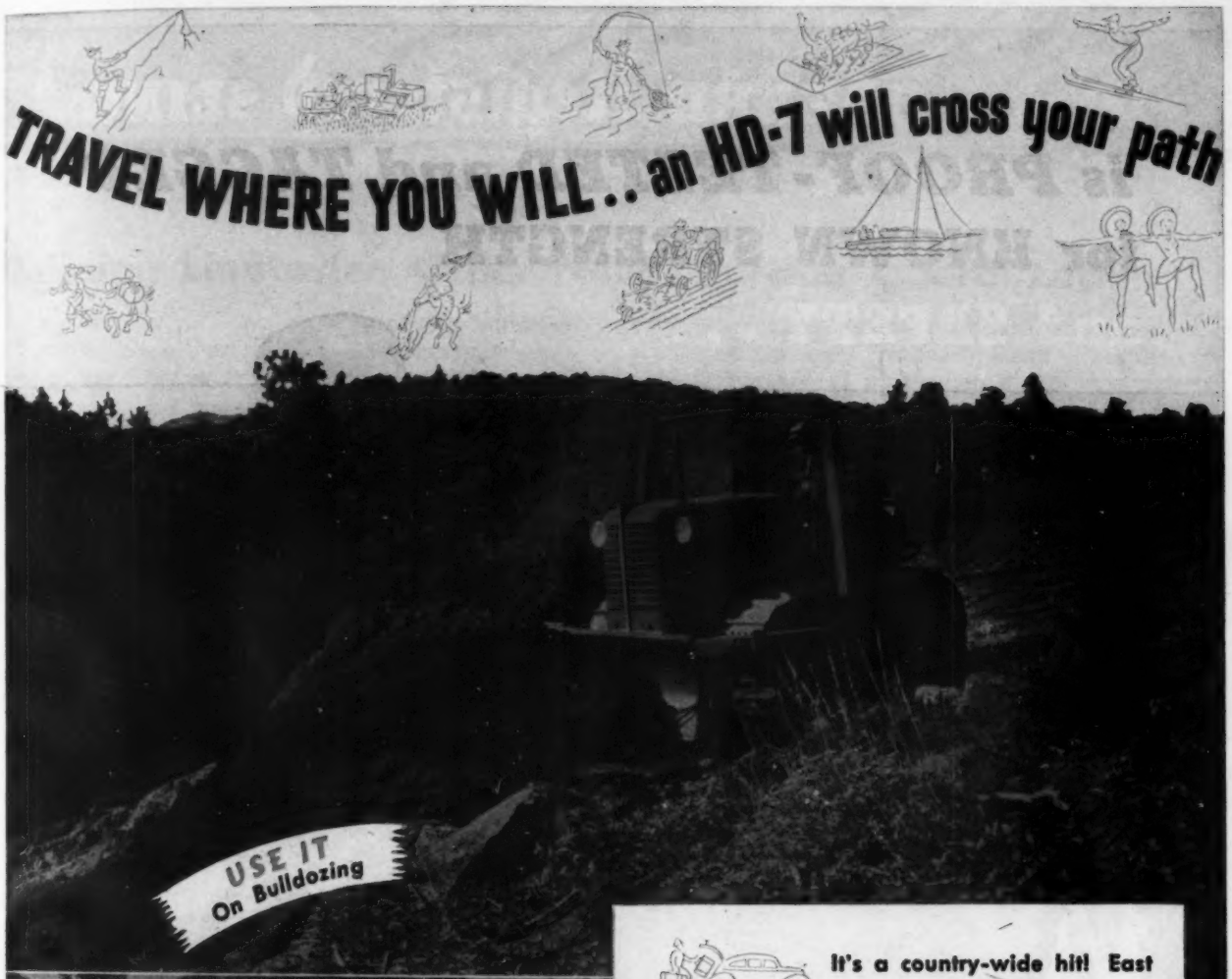
Total savings exceeded $3,800.00 against new equipment.

This job still performing three years after being completed and crushing better than 2000 tons of rock per day.

Investigate "Two-Tone" savings on heavy maintenance work.

RESISTO-LOY CO. • GRAND RAPIDS 7, MICH.

TRAVEL WHERE YOU WILL .. an HD-7 will cross your path



It's a country-wide hit! East Coast, West Coast, North and South . . . popular Allis-Chalmers Model HD-7 2-Cycle Diesel Tractor is in demand everywhere . . . by contractors, states, counties, townships, ranchers, loggers, miners, gravel and quarry pit operators . . . for a multitude of jobs! Just the right size for most bulldozing work, ideal for operating 2-wheel scrapers — provides 60 drawbar h.p., speeds to 5 m.p.h. . . . it's easy on fuel, easy on maintenance cost, easy to maneuver. Starts instantly! Travel where you will . . . you will find the HD-7 keeping production up . . . costs down. It will pay you to get all the facts from your Allis-Chalmers dealer.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

Every HAZARD Registered SLING is PROOF-TESTED and TAGGED for KNOWN STRENGTH and SAFETY . . .

Hazard offers you a wire rope sling service—never before available. In the first place, Hazard supplies the exact type of sling you need for your particular job—whether standard wire rope, braided wire rope or cable-laid. You also have choice of standard terminals or newly developed, load-tested endings such as the ACCO-LOC Safety Splice and the U-LOC.

More than this, every Hazard Registered Sling is proof-tested to twice its rated capacity before it leaves the mill. Then it is numbered and indelibly marked with a metal tag stating its maximum safe load. You get a Certificate of Test and Registry which certifies to the sling's pre-determined safety. All Hazard Registered slings are made of LAY-SET Preformed Wire Rope—easy, fast and safe to handle. Write for literature.

ACCO

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Seattle, Bridgeport, Conn.

HAZARD WIRE ROPE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

★ ★ ★ Editor's Page

Building Limitation Order Needs Further Liberalization

AT FIRST GLANCE, the March 26th building limitation order, postponing practically all construction except homes for war veterans, was as drastic as any war restriction. The limitations, since, have come to seem less severe now that some of the order's provisions are being clarified and liberalized.

Purpose of the order, to enable veterans to secure priorities for building materials so that low cost homes (mostly to cost $6000 or less) might be constructed for them, is all right in theory, but the heavy construction industry is entitled to a squawk. While suppliers of building materials will have outlets for their products, mainly in a definite class of construction, the clamp on industrial and commercial building, by its very suddenness, will be costly to the heavy construction industry. The transition cannot come cheaply and the loss of business that was just ahead is serious.

There is bound to be a still further delay to our peacetime economic recovery, with this deferment of plant construction for industry, and the veteran won't necessarily benefit. His new home may prove a liability.

With everything in the war veteran's favor—priorities over everyone else and liberal financing, with as little as five percent down payment—the temptation will be there for unqualified veterans to build, and assume a financial burden in a "high cost" home at a time when many of them never should have considered building.

The home in the $6000 price class (including the lot) which National Housing Expediter Wilson W. Wyatt emphasizes will constitute the majority of single unit dwellings to be built, would saddle many a veteran with a dubious investment and at a time when he has not yet settled on his post-war career. Obviously, the land on which such a home would be built, at today's prices, could well present problems in its location with respect to schools, recreation centers and public utilities.

The March 26th order does not alter the fact that we are in a period of real estate inflation that is getting out of control. Materials and labor continue scarce and home building costs are 44 percent over the levels of a few years ago. Anyone building today is doing so at a time when contractors cannot forecast costs and therefore are reluctant even to quote definite prices. In the field of public building, some resort to cost-plus-fixed-fee contracts has been the means to get building done and projects have had to be scaled down—to emphasize how difficult building actually is.

The objective of the National Housing Administration, through priorities, to place 2,700,000 homes in veterans' hands by the end of 1947, and then to issue permits for certain classes of essential construction won't leave much building material over for non-veterans and businesses desiring to build, unless the two chief deterrents to production, strikes and pricing policies are corrected.

Prices and Scarcity

Under today's conditions, priorities for building materials mean little more than that permission has been granted holders to shop around for their needs. Without priorities, it will be practically impossible to secure building materials, with the result that ordinary private building likely will be delayed until the housing plan has been completed or has failed.

It has been estimated that possibly 60 to 75 percent of the scarce materials will be sold to priority holders, which means that permit holders and those not so favored will be competing for an extremely scarce supply. Labor also is far from plentiful. The $3 and $4 an hour bricklayer in metropolitan areas is a good example. A perfect setting for the stimulation of black markets and illegal supply sources will have been created. It is being demonstrated every day that inflation breeds black markets, a condition which never has existed where production keeps pace with purchasing power. Certainly the country has proven unable to cope with the black market even without creating an exaggerated shortage.

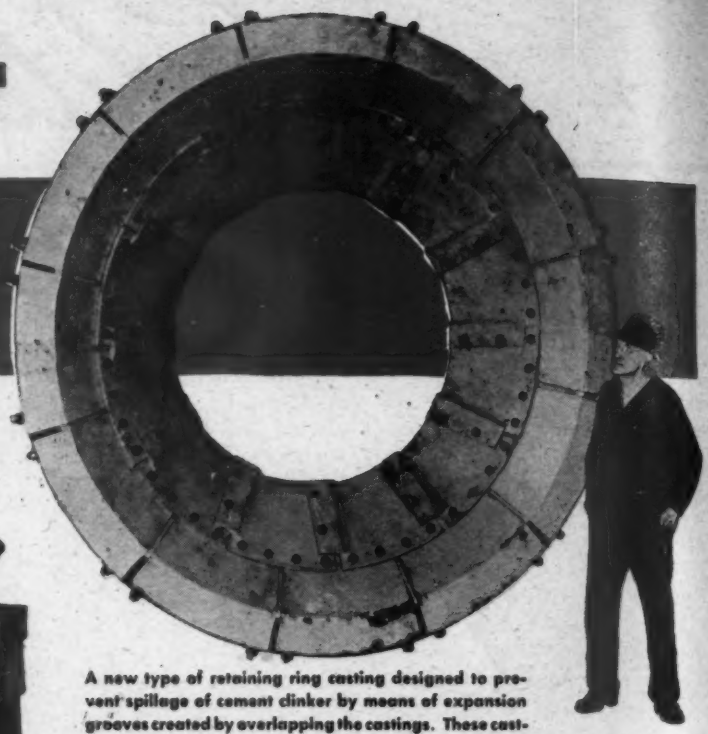
An immediate retarding effect of the new order will be the time lost in getting the priorities and permits system in working order and in the establishment of community advisory committees which will *judge* each case. Getting back to builders in the heavy construction field, they suffer immediate loss for they have spent months in reorganization and preparation, and at considerable expense, for their participation in what was probably the largest budding non-residential building spree in history. Job-creating construction, by industry, has been shelved. It has been estimated that the cut in commercial and industrial building will be to approximately one-half the present rate until recovery in 1947.

The real solution points toward intelligent application of pricing, at least on scarce items common to both light and heavy classes of construction. Price increases on such items would encourage production and go a long way toward overcoming the scarcity that is whipping construction. The effect on the finished commodity—buildings—could well be a reduction in cost through elimination of black markets and delays.

Bror Nordberg

Cast to LAST

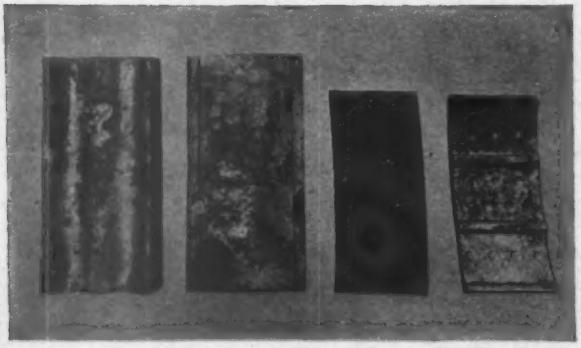
on cement mill equipment



A new type of retaining ring casting designed to prevent spillage of cement clinker by means of expansion grooves created by overlapping the castings. These castings are operated without any refractory protection.

B&W ALLOY CASTINGS

Cast rotary kiln feed pipes, 7½" O.D. x 9' 8½" long, for a cement plant in Pennsylvania.



B&W Tube Mill Liner Castings.

ON A KILN where previous nose ring castings lasted but eight months, B&W Alloy Castings have stood up for three long years—and are good for several more!

Castings that give such lasting service under severe, high-temperature conditions, are a big help in reducing time-consuming repairs and replacement shut-downs.

B&W Alloy Castings—in practically any shape or weight—can be supplied in analyses to meet almost any set of requirements encountered in rock products equipment. They withstand service temperatures up to 2000 F., under conditions requiring high creep strength, consistent with long-time stability. They are produced in the modern B&W foundry, which is equipped with electric induction furnaces, heat-treating facilities, electric welding apparatus, and X-ray inspection equipment.

For castings that *last*, get in touch with B&W. The experience gained in helping others solve their equipment problems with B&W Alloy Castings is always available to you without obligation.

Water-Tube Boilers, for Stationary Power Plants, for Marine Service . . . Water-Cooled Furnaces . . . Superheaters . . . Economizers . . . Air Heaters . . . Pulverized-Coal Equipment . . . Chain-Grate Stokers . . . Oil, Gas and Multifuel Burners . . . Seamless and Welded Tubes and Pipe . . . Refractories . . . Process Equipment

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C-44

High Wages and Prosperity

IT APPEARS from the announcement by O.P.A. on April 9 that price ceilings on practically all kinds of production machinery have been removed. When we predicted this would happen in "Notes" of last February we had no inside information. Merely, we were convinced that before June 30 even the O.P.A. would see that price controls on machinery needed for production of consumer goods were bottle necks in providing the commodities every one wants. It does not matter too much what price a producer pays for machinery he needs for economical operation, if he can get it installed and into production when he needs it most.

From conversation with a highly placed O.P.A. executive, when we tried to put this idea across, we got the impression that Washington bureaucrats are still thinking in terms of unemployment, and are afraid that new and improved machinery will displace labor. Apparently they were not thinking of the labor which would not be employed if the machines were not manufactured. Naturally, producers of standard commodities will buy new machinery primarily to reduce costs. Otherwise, there is little probability that they can stay within their own price ceilings.

This is no mere argument, as proved by the recent announcement of the Johns-Manville Corp. that it had temporarily and "reluctantly" withdrawn from the manufacture of certain types of asbestos cement shingles, asbestos wall-board and some other products, all vitally needed for housing construction, which the government is trying so hard to encourage. The corporation said that manufacturing costs cannot be recovered under present national price schedules. Since there are substitutes for these building materials, it may be they will get no price relief. In the case of gypsum lath, presumably because of the scarcity of substitutes, the O.P.A. some months ago was forced to raise price ceilings very considerably.

Muddled Political Economy

All this goes to show how fuzzy is economic thinking on the part of those who establish and try to enforce rules and regulations to govern private enterprise and nullify the laws of tried and tested economics. We have all been befuddled to some extent by the economic experiences of the last quarter century. During the 1930's depression probably most of us subscribed to the often repeated phrase that "the depression was caused by the inability of labor (which included practically all the American public) to purchase that which industry manufactured because the wages of labor were not sufficiently high."

Few of us, probably, have ever reasoned out just what this means. For example, what good will it do to raise every one's income if the eventual result is merely an all around increase in prices? Obviously, it does no good; but it will keep our domestic economy in turmoil; and eventually it will price our goods out of foreign markets. Even now, according to the *Wall Street Journal*, delegates from Central and South America to the World Monetary Conference at Savannah, Ga., have told Americans that our country is slowly but surely pricing itself out of Latin American markets. Quoting a staff correspondent of the *Journal:* "For the present, these delegates say the United States is the only major country with goods to offer the world or the capacity to produce them, and for that reason foreign buyers must in general buy here or nowhere. But the continued rising prices for American goods, they feel, will gradually drive Latin American buyers elsewhere as the other industrial nations begin to get back into production."

An axiom of banking is "the dollar goes wherever it gets the best treatment." That means, not only that Latin American dollars will go where they buy to best advantage, but that American dollars being held in this country for investment in productive enterprises, will go abroad to countries where labor is more reasonable and costs of production are less. If plans now in the making by the U. S. Government are carried out, foreign trade controls everywhere will be slackened and we shall have something like free world trade. Many American industries which depend on protective tariffs to keep their domestic markets, will then be driven to establishing plants abroad to compete with foreign manufacturers, not only for the world's markets, but for our own domestic markets.

Imports vs. Employment

Of course, this is not probable, soon, because the same high-pressure groups responsible for pricing their employers out of the markets, will be the first to apply pressure for protection. However, the people of this country who don't belong to pressure groups, and can't get their incomes raised to keep pace with organized labor, are entitled to spend their dollars, or invest their dollars, where these will receive the best treatment. If they are compelled by tariff laws to spend their money for price inflated goods manufactured at home, their buying power will be so deflated that unemployment and depression will come again to those same pressure groups who so heedlessly inflated their own wages.

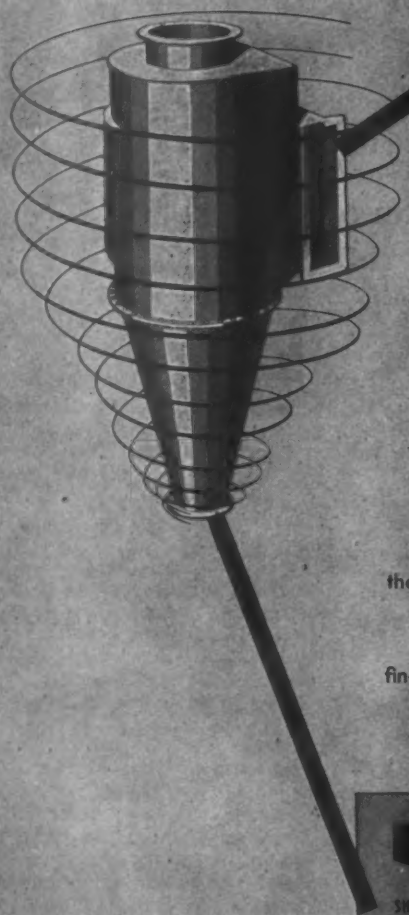
Those of us who remember the depression of the 1930's probably now realize that it was brought on largely because the incomes of some groups of our population got too far out of line. As a matter of fact labor's income got way ahead of farm income. The farmer and the small-town business men who depend on farm income lost their buying power, and that eventually cost the factory and office man his job. Our present system of farm subsidies, designed to prevent a repetition, is economically unsound—all subsidies are unsound.

The only logical answer to this "purchasing power" argument was given by Henry Hazlitt in the *New York Times*, last September 24, as follows: "As to the prices, wages, and profits that should determine the distribution of the product, the best prices are not the highest prices, but the prices that encourage the largest volume of sales. The best wage rates for labor are not the highest wage rates, but the wage rates that permit full production, full employment, and the largest sustained payrolls. The best profits, from the standpoint not only of industry but of labor, are not the lowest profits, but the profits that encourage the most people to become employers or to provide more employment."

We must be as ready to reduce prices and wages in the public interest as to raise them. Meanwhile we will continue to experiment to find the happy medium.

Nathan C. Rockwood

Consult Buell *First* in Dust Recovery



Buell Fly Ash Collectors, employing exclusively the well-known van Tongeren System of dust collection, are internationally known throughout industry for "High efficiency, Low maintenance, Long life." Among their outstanding qualities and performance characteristics are: (1) high efficiency mechanical flue dust collection to meet the specific requirements of any job, (2) ready adaptability to any existing duct work, (3) low initial cost, (4) low maintenance and operating cost, (5) power consumption as low as 1 H. P. per 20,000 pounds of gas per hour. Buell's Bulletin, illustrated above, explains in chart and illustration the Buell (van Tongeren) principle of industrial dust recovery.

Every operating executive and engineer will find it most helpful in the selection of dust recovery equipment for his particular requirements.

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DUST RECOVERY SYSTEMS

BUELL FEATURES	RESULT IN	PRODUCE
SHAVE-OFF LARGE DIAMETERS	HIGH COLLECTION EFFICIENCY	GREATER RECOVERY
EXTRA-THICK METAL	LESS FAN BLADE WEAR	LOW MAINTENANCE
LARGE OUTLETS	LOW DRAFT LOSS	LOW OPERATING COST
INNER WELDS GROUND SMOOTH	LOW POWER CONSUMPTION	LONG LIFE
CORRECTLY DESIGNED HOPPERS	HIGH TEMPERATURE RESISTANCE	NO CLOGGING
SPLIT-DUCT MANIFOLDS	UNLIMITED CAPACITY	
	NO MOVING PARTS	
	FREE DUST FLOW	

BUELL ENGINEERING COMPANY, INC., 2 Cedar Street, Suite 5000, New York 5, N.Y. *Sales Representatives in Principal Cities*

Washington NEWS

CONGRESSIONAL committee hearings on the question of continuing O.P.A. have become verbal battles with manufacturers lined up almost solidly against continuance and with labor, particularly C.I.O., on the opposing front. The Committee for Economic Development has taken a middle-of-the-road stand, recognizing that some O.P.A. controls must be retained after June 30. The Committee points out that price control has no permanent place in the peacetime American economy. "Prices cannot be centrally controlled for any sustained period," stated the committee, "without inefficiency, inequity, breakdown of respect for law and, most important, serious danger to our personal and political freedoms." Referring to the program which should be followed, the committee took the stand that "a quick and orderly termination of price control can only be assured by a positive program embracing both bold measures of decontrol and courageous fiscal and monetary policies to combat inflation."

Construction Costs Zooming

With rising labor and material prices, the States are finding it difficult to determine cost of construction. To keep prices down, the Federal government has notified States that it will not participate in any road building program in which the cost of materials is more than 135 percent of 1940. Prices of basic road construction and building materials, such as sand and gravel, crushed stone, slag, and cement, have not risen much above the 1942 level, but labor and other elements of contractors' costs have jumped to new high levels. Road construction programs have advanced to the stage of contract letting in many States, but it is doubtful whether the work will get very far under way until 1947. New York's $255,000,000 highway program has been started by opening bids for 1946. Michigan is receiving bids on the first part of its $78,000,000 program. Illinois has a $100,000,000 program under way, and Texas is letting its first post-war contracts in the State's 7,025 mile farm-to-market program.

OPA Exempts Heavy Machinery

In an effort to placate the rising storm against pricing policies, O.P.A. recently announced suspension orders covering nearly all heavy machinery and equipment. The major product lines being suspended from price control include:

Electrical—Steam, hydraulic, and gas turbines; direct current arc welding equipment; electric motors of 250 horsepower and more; transformers of 500 kva. and over; telephone central station and other telephone equipment, antenna systems and towers, domestic watt-hours meters.

Machine tools—Large types of new and second hand machine tools.

Processing machinery—Many types of textile machinery; specially built Webb-fed newspaper and magazine printing presses.

Construction equipment—Dredges; lock and dam machinery listed in Revised Maximum Price Regulation 136, Appendix A.

Transportation equipment—Locomotives and tenders, freight cars, passenger cars for surface, subway or elevated lines; many railroad parts and specialties; industrial hand trucks; passenger and freight elevators and escalators.

Also, industrial casters, mechanical precision springs, gaskets, dies, jigs, fixtures, molds and patterns, with some exceptions; open or flat die forgings (except commercial drop forgings); tire chains; some diesel engines; steam generating equipment; industrial and marine stokers with feeding capacities of 1200 pounds per hour or more; industrial conveyors and conveying systems of stationary type with some exceptions.

Also industrial lifting magnets, X-ray tubes, specified types of switch gear, some baling presses, certain types of foundry machinery and equipment, flexible metallic hose and tubing except electric metallic tubing, hand-operated tools, especially designed for military aircraft.

PAUL A. PORTER, Administrator of O.P.A., said that the suspension of price ceilings for machinery was of an experimental nature, and that the trend of prices and diversion of manpower, materials, or facilities will be watched carefully and controls restored if inflationary prices or serious diversion occurs.

Cement Stocks Declining

Reserve stocks of portland cement at the mills have been rapidly depleted in many areas. The National Concrete Masonry Association has advised its members to contact sources of supply to ascertain that ample supplies may be available for continuance of operations. The short supply of concrete masonry units has made it urgent that production be maintained at a high level if the government's housing program is to be carried out. Concrete products producers have been advised that under directive No. 8 to PR28, machinery requirements can be met by applying for CC ratings. Applications should be filed on form C.P.A. 541-A.

Crude Gypsum in Shortage Areas

Crude gypsum sold for use as an inert filler in dry colors has been added by the O.P.A. to the list of specified buildings materials which producers may ship outside their normal marketing areas into temporary shortage areas under the special pricing method authorized last December. Under the new action, effective March 27, 1946, producers may under certain conditions add the full amount of freight costs to the f.o.b. plant maximum prices of their product. The dry-color manufacturers are expected to absorb the increase.

Ready Mix Increase

Under Amendment No. 34 to Order No. 1 under Section 25, MPR 592, manufacturers of ready-mixed concrete sold in nine southern states may now add to their ceiling prices the dollar-and-cent amount of their increased cost caused by the recent 10-cent a barrel increase in portland cement ceilings.

The action, effective March 27, 1946, applies to sales of ready-mixed concrete in Georgia, Alabama, Tennessee, Louisiana, Mississippi, North Carolina, South Carolina, Florida, and part of Virginia.

Previously, O.P.A. authorized a 10-cent increase in the ceiling of portland cement sold in certain states, which became effective February 21, 1946. This increase was in addition to a similar rise approved last November and brought the total increase over March, 1942, prices for portland cement to 20 cents a barrel in this area.

As in the action last fall, O.P.A. allows the manufacturers of ready-mixed concrete to pass through the costs of the dollar-and-cent cement increase to them. Production, sales, and margin data showed that producers, if required to absorb the cement increase, would realize less than their average pre-war earnings.

SUPERIOR CONCRETE PRODUCTS at no extra cost with Duraplastic Cement

Seven years of successful field performance on a variety of paving and building jobs have shown that Atlas Duraplastic air-entraining portland cement makes better concrete at no extra cost.

Noting this, a number of manufacturers of concrete block, drain tile, machine-made pipe, and silo staves of the tamped type have substituted Duraplastic cement for regular cement for their products with highly satisfactory results. Its use for concrete block, for example, shows the following:

1. **No added expense or unusual changes in methods.**
2. **Generally improved appearance, more exact edges and corners, truer dimensions, improved face texture.**
3. **Denser, more compact product.**
4. **Generally increased compressive strength.**
5. **Less breakage and less cracking in handling from machines to racks to kilns; fewer culls and throwbacks.**
6. **Lower absorption of water and greater resistance to passage of water.**

Atlas Duraplastic cement complies with ASTM specifications and sells at same price as regular cement. Send for further information. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Bldg., New York 17, N. Y.

OFFICES: New York, Chicago, Philadelphia, Boston, Albany, Pittsburgh, Cleveland, Minneapolis, Duluth, St Louis, Kansas City, Des Moines, Birmingham, Waco.

RP-D-33

ATLAS DURAPLASTIC

TRADE MARK REG. U. S. A. C. CO.

A UNIVERSAL ATLAS PRODUCT

AIR-ENTRAINING PORTLAND CEMENT

Makes Superior Concrete Products at No Extra Cost

"THE THEATRE GUILD ON THE AIR"— *sponsored by U. S. Steel — Sunday Evenings — A B C Network*

the *Personal Side* of the news

Penn-Dixie Promotions

W. H. KLEIN, vice-president of the Pennsylvania-Dixie Cement Corp., New York, N. Y., has been appointed

W. H. Klein

vice-president of research and development, with headquarters in New York City, and CARL J. LOFSTEDT has been made general operating manager, with headquarters in Nazareth, Penn. Mr. Klein has been vice-president and a member of the board of directors of the corporation since 1936 and has served as general operating manager for 12 years. He came to the company in 1926, at the time it was organized, from the Dixie Portland Cement Corp., one of the predecessor companies, and has been connected with the cement industry

Carl J. Lofstedt

since 1906. Mr. Lofstedt has been identified with the cement industry since 1916 in various operating and engineering capacities. He was with the Lone Star Cement Corp. for 20 years and for the last seven years has been general superintendent of all their South American plants.

Technical Director

C. J. LEWIS has been appointed technical director of Warner Co., Philadelphia, Penn. All technical development, research functions and laboratories, and managers and operators of these departments, will come under his general direction. Mr. Lewis will report direct to the president, Charles Warner. In line with this change, Irving Warner will discontinue his general authority over the operation of the Cedar Hollow research and laboratory work in the direct charge of J. A. Murray.

Make Concrete Block

W. R. PHILLIPS AND LAYTON D. PHILLIPS, brothers, who were recently discharged from the armed services, have started production of concrete block at Columbus, Miss. W. R. Phillips spent 29 months in the Seabees and saw action in many of the Pacific battles including those at the Marianas, Iwo Jima and Japan. Layton Phillips spent five years in the Field Artillery and was in the European area for about two years.

Join Riverton Firm

W. B. STERN AND A. F. PULLEN have recently joined the staff of the Riverton Lime and Stone Co., Riverton, Va. Mr. Stern has been appointed assistant to H. W. Smith, vice-president in charge of operations. Mr. Pullen, recently discharged from the armed forces, will be a chemist in the plant laboratory.

Sales Representative

WILLIAM L. PLATT has been appointed sales representative for the Columbia Chemical Division of the Pittsburgh Plate Glass Co., Pittsburgh, Penn. He will be located in Boston, Mass. Prior to his appointment to the chemical division in 1930, Mr. Platt was associated with the glass division.

Mine Engineer

MAYNARD H. VAN ORNUM, formerly with the U. S. Bureau of Mines, has been appointed mine engineer for the U. S. Gypsum Co., Plasterco, Va.

Research Director

E. J. MAUST has been made director of research at the Plant City, Fla., plant of the Coronet Phosphate Co., New York, N. Y.

Sales Manager

FRED C. DORENBUSH, who has been associated with the Grand Rapids Gravel Co., Grand Rapids, Mich., for

Fred C. Dorenbush

a number of years, has been appointed sales manager of the company.

Fifty Years of Service

EDWARD QUEBBEMAN, sales manager of the Universal Atlas Cement Co., Chicago, Ill., recently celebrated his fiftieth year of active service with the company at a dinner given him by his business associates. Mr. Quebbeman started in the St. Louis office of the organization while it was still

Edward Quebbeman

only a department of the Illinois Steel Co. In a few years he became a junior clerk, later was advanced to salesman and then to division sales manager. Since 1928 he has been sales manager for the territory including Indiana, Michigan, Wisconsin, Kentucky and Illinois except metropolitan Chicago. During his long career he has selected and trained many salesmen.

Carney Official Returns

TED P. WALTERS, who was recently discharged from the Naval Reserve, has returned to the Carney Company and is now temporarily assigned to the general sales office in Minneapolis assisting N. A. Holmer, general sales manager. He expects to return to Mankato the first of the year to carry on in his former position as assistant to H. E. Carney, Jr., president. Prior to the war, Mr. Walters was a director of The Carney Rockwool Co. and was very active in the building industry in the northwest. At one time he was president of the Mankato Builders Exchange. Mr. Walters was a Quartermaster 2nd Class on the U.S.S. Gatling which participated in 15 major naval engagements in the Pacific. LEROY C. CHRISTENSEN, also recently discharged from the Navy, will represent the Carney Co. in the sale of masonry and natural cement in the Twin City metropolitan area. He will make his headquarters in the Minneapolis office.

In Block Business

R. M. AND J. D. NORMAN, both released from the armed services in January, 1946, have started block production in Amory, Miss. R. M. Norman served 18 months in the Signal Corps and spent 14 months in the Philippines campaign, but prior to entering the Army he was a bulldozer operator for a construction company. J. D. Norman spent three and one-half years in the Marines, all but one of which was spent in the Pacific area. Awarded the Purple Heart for wounds received at Saipan, he was also in the engagements at Tarawa, Tinian and Okinawa.

R. M. Norman and J. D. Norman

General Superintendent

CAPT. CHARLES MULLER, after 30 years of service with the Flint Sand and Gravel Co., Inc., and Jahncke Service, New Orleans, La., has retired as general superintendent of the Bluff Creek, La., plant. FRED WIDAS, who has also been with the company for the past 30 years, will succeed Capt. Muller as general superintendent. DAVIS JAHNCKE has been made manager of the plant.

Joins Lehigh University

H. R. GAULT, formerly with the Alaskan Branch of the Geological Survey working in southeastern Alaska and on the Seward Peninsula, has been appointed assistant professor of geology at Lehigh University.

Named General Manager

WALTER K. FARST, chief engineer in chemical plants operated by the Columbia Chemical Division of the

Walter K. Farst

Pittsburgh Plate Glass Co., Pittsburgh, Penn., has been appointed general manager of the cement plant at Zanesville, Ohio. He succeeds the late Arthur R. Haley. Mr. Farst has been associated with the Columbia Chemical Division for 23 years, including ten months during 1942 when the division was preparing the Defense Plant Corporation's Natrium, W. Va., plant for production of liquid chlorine and caustic soda. During 1940, he served as assistant chief engineer at the Barberton, Ohio, plant. Prior to that he was field engineer at the Ohio plant.

Made Chief Clerk

J. W. GWIN has been appointed chief clerk of the Ideal Cement Co., Colorado Portland division, Portland, Colo., replacing E. J. Stampfel, who has resigned. Mr. Gwin was formerly at the Hanover, Mont., plant.

Edith T. Sisler

Lady Manager

MRS. EDITH T. SISLER, owner of the Standard Cast Stone Corp., Harrisonburg, Va., is one of the few women producers in the concrete masonry field. When her husband died four years ago, Mrs. Sisler determined to carry on as manager of his concrete block business. As an indication of her success in the field, the plant is now producing 1200 block per day and expansion of the capacity is planned. In addition, she is considering the purchase of a second block plant in the Georgia or Florida area.

Return to Products Co.

ADOLPH CHISOLM AND WILLIE T. BEARDEN have returned to the Pool Concrete Products Co., Meridian, Miss., as superintendent and mechanic, respectively, after release from the armed services. Mr. Chisolm spent two years with the Marines and saw action at Saipan, Okinawa and Japan. Mr. Bearden was in the Navy for three years on convoy duty and submarine patrol in Alaskan waters and in the North Atlantic.

Adolph Chisolm and Willie T. Bearden

Elected General Manager of Lime Association

By unanimous action at the annual meeting of the National Lime Association in Hot Springs, Va., on March 30, 1946, the members ratified the election by the Board of Directors of ROBERT S. BOYNTON as general manager of the Association and S. WALTER STAUFFER was reelected president. Mr. Boynton needs no introduction to many members of the industry. During the war he was Chief of the Alkali Section of the Chemical Division of the War Production Board and, along with other commodities, handled problems pertaining to the production and distribution of chemical lime. Before coming to the War Production Board, on a leave of absence from his company, he was employed by the Solvay Process Co., first in the operating department and later in the sales department. After V-J Day, he accepted a position as manager of the Industrial Chemical Division of Ashcraft-Wilkinson Co., Atlanta, Ga., which position he has now resigned to come with the Association.

Reelected Chairman

ERIC A. JOHNSTON, president of the United States Chamber of Commerce, has been reelected chairman of the board of directors of the Washington Brick and Lime Co., Spokane, Wash. NEAL FOSSEEN was reelected president, VICTOR P. KELSEY was chosen vice-president and ERNEST L. FRANK secretary-treasurer. A new member of the board is A. WILLIAM MORRIS of Spokane. All the officers are members of the board and, in addition, there are Charles P. Lund of Spokane, W. E. Coleman, Portland, and W. T. S. Roth, Ackley, Iowa. JAMES D. MASON of Spokane has been appointed production manager. LARS CARLSON, Seattle, regional director of the C.E.D. for Washington, Oregon and Utah, will join the firm as sales manager.

Completes 50 Years

FRED W. KUHL, secretary-treasurer of the Kelley Island Lime and Transport Co., Cleveland, Ohio, was honored at a dinner recently on the completion of 50 years of service with the firm. Mr. Kuhl started with the company as an office boy in 1896 and was appointed to present position in 1928. He is also vice-president and a director of the South Side Federal Savings and Loan Association.

Resigns

GORDON TONGUE, secretary-treasurer of Superior Portland Cement, Inc., Seattle, Wash., has resigned to accept a position with C. E. Howard and Co., Los Angeles, Calif., stainless steel fabricators. GEORGE A. CAMPBELL, auditor, who has been with the company since 1910, has been appointed treasurer, and JACK B. LOUGHARY, sales manager, has been made secretary. Mr. Tongue is past president of the Seattle Rotary Club; was chairman for four years of the State Personnel Board, and is past chairman of the Pacific Northwest Advisory Board, comprising shippers of Washington, Oregon and northern Idaho. He is also past treasurer and vice-chairman of the Federated Industries of Washington, which he helped to merge with the Manufacturers Association of Washington to form the present Association of Washington Industries, and has headed various committees of the Seattle Chamber of Commerce.

Starts Own Business

H. T. EVERRITT, formerly a dragline operator for the Twin City Gravel and Concrete Co., Monroe, La., has

H. T. Everritt

started a concrete masonry unit plant in West Monroe, La. Mr. Everritt, who served as an engineer in the Air Force for three years, was shot down over Munich in June, 1944, was captured by the Germans and spent 11 months in prison camps in Stettin, Nuernberg and Moosberg. He was released from prison when Gen. Patton's Third Army made its sweep through Germany in April, 1945.

New Officers

ALBERT R. HOCK has been elected president of Dolese & Shepard Co., Chicago, Ill. William Roy Carney has been named vice-president, William J. Stoffel, treasurer, and Bartholomew P. Doody, secretary.

Leaves Phosphate Co.

CHARLES N. BECKER, manager of the Bartow, Fla., plant of the Southern Phosphate Corp., New York, N. Y., has resigned from the position he has held for the last two years. He has been with the corporation for 26 years.

OBITUARIES

JOHN A. BLANK, a pioneer in the cement industry and consulting chemical engineer for Cementos Atoyac, S.A., Puebla, Puebla, Mexico, and Cementos Veracruz, S.A., Orizaba, Veracruz, Mexico, was killed March 10 in an automobile accident near Henderson, N. C. He was 66 years old. Accompanied by Mrs. Blank, who succumbed March 29 to injuries received in the accident, Mr. Blank had been visiting cement plants in the United States and was on his way to his home in Ironton, Ohio. He was formerly associated with the Phoenix Cement Co., Nazareth, Penn., and later became superintendent of the Ironton, Ohio, plant of the Lehigh Portland Cement Co., New Castle, Penn. He supervised the erection of cement plant at Orizaba, of which his son, Alton J. Blank, is general manager.

CARL FIELD, founder and president of the Northwest Talc and Magnesium Co., Clear Lake, Wash., died February 20 after a short illness. He was 56 years of age. Mr. Field was a native of Drammen, Norway, and came to the United States in 1910. He was engaged in the real estate and mining business before founding the talc and magnesium firm in 1942.

FRANK E. RISTINE, retired superintendent of the Limestone, Wash., plant of the Olympic Portland Cement Co., Ltd., Seattle, Wash., passed away recently. He was 79 years old. Mr. Ristine had been superintendent for 28 years. He retired in 1941, when he was 75 years of age, and was succeeded as superintendent by his son, Joe Ristine, Maple Falls, Wash.

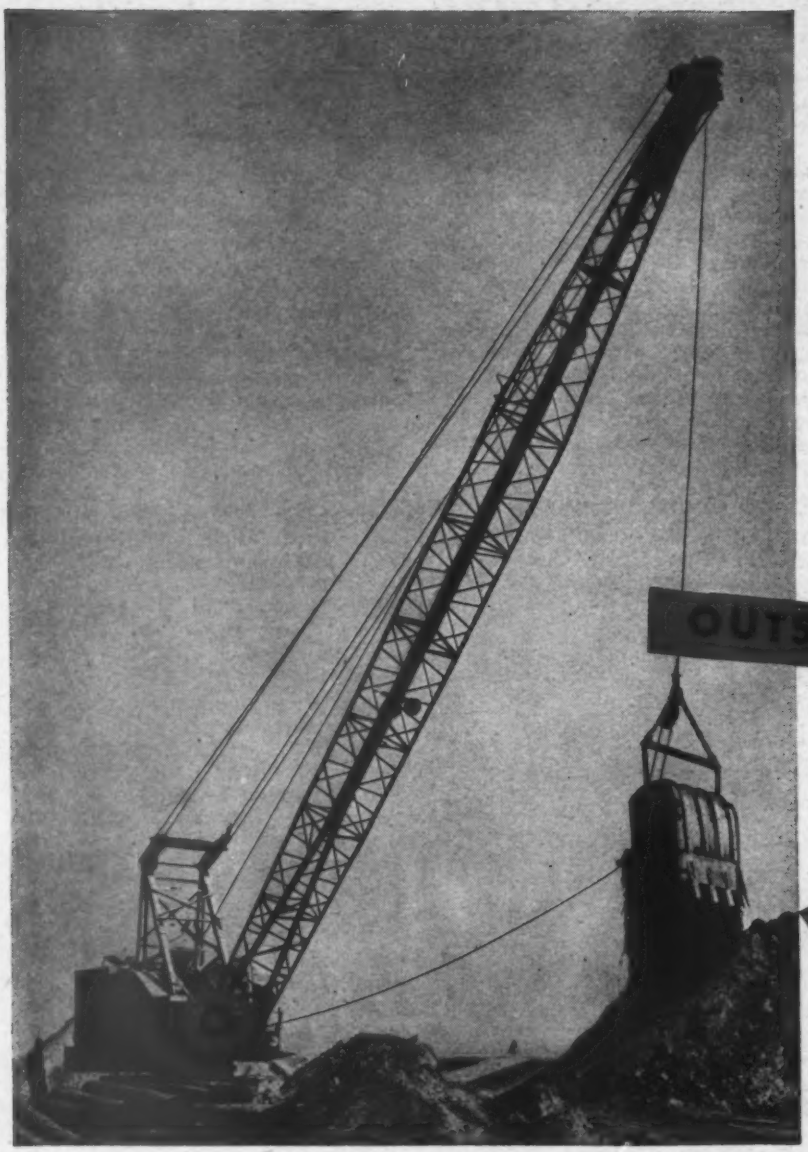
OSCAR LOTZ, owner and operator of the Carl Lotz Sand and Gravel Co., Wausau, Wis., died recently after a short illness. Mr. Lotz was widely known in Wausau and throughout northern Wisconsin. He was 45 years old at the time of his death.

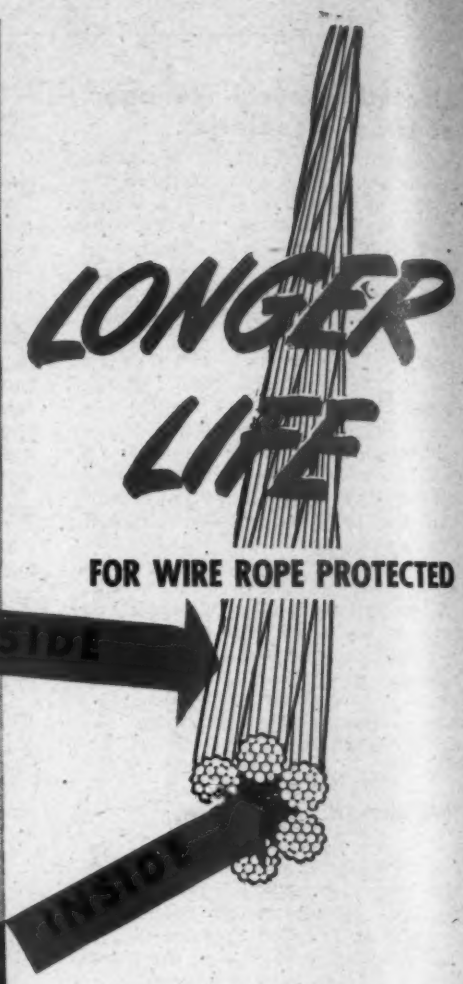
LAWRENCE MOSER, president and owner of the Moser Construction Co., and a partner in the Potter Concrete Block Co., Cincinnati, Ohio, died after an illness of six weeks. He was 44 years old.

LEWIS H. ROTHRAUFF, who owned and operated the Spring Sand and Stone Co., Sinking Spring, Penn., for the last 25 years, died February 5 at the age of 60.

CHARLES R. JACKSON, chief chemist of the Okay, Ark., plant of the Ideal Cement Co., Denver, Colo., passed away January 24 after a short illness.

ALBERT LESTER SHEFFER, president of the Bloomsburg Sand and Gravel Co., Bloomsburg, Penn., passed away February 23 at the age of 73.





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TEXACO

TEXACO Lubricants and Fuels

TUNE IN TEXACO STAR THEATRE EVERY SUNDAY NIGHT STARRING JAMES MELTON WITH HIS GUEST, ED WYNN—CBS

news OF THE INDUSTRY

Expands Operations

SOUTHERN BLOCK AND PIPE CORP., Norfolk, Va., has purchased the land and machinery of the Allied Concrete Products Corp. The officers of the new operation will be H. C. Hofheimer, II, president; Buford Bookout, vice-president; and Richard C. Goodman, secretary and treasurer.

Mr. Hofheimer has been connected with the construction industry in the Norfolk area for 20 years, and is secretary and treasurer of Southern Materials Co., Inc., of Norfolk.

Mr. Bookout has been plant superintendent for Mid-Atlantic Concrete Products Corp. and Allied Concrete Products Corp. for eighteen years. Mr. Goodman has just returned from six years of service in the navy, serving as Lieut. Comdr. in the submarine service.

The new corporation plans to increase the present plant capacity to help alleviate the shortage of building material in the Norfolk area.

Close Cowell Plant

COWELL PORTLAND CEMENT CO., San Francisco, Calif., has closed its Clayton Valley cement plant due to exhaustion of its limestone quarry. Earl D. Barnett, plant superintendent, reported that the quarry was closed February 26, and there is enough material on hand for processing to last until late summer. Superintendent Barnett said that it would be unprofitable for the company to ship in limestone as the plant lost its only rail connection when the Navy took over the Bay Point and Clayton Railroad, formerly operated by the Cowell interests.

Increase Gravel Operations

THE WACHTER TRANSFER CORP., Bismarck, N. Dak., is equipping a new sand and gravel plant near the airport. Leslie A. French, manager, announced that the plant should be in operation early in the summer.

Merge Interests

THE JOHNSON GRAVEL AND CONTRACTING CO., Centralia, Wash., is the new name of Sandkay Contractors, according to R. F. Johnson, owner. The company's operations will be expanded with the purchase of the Poore Brothers sand and gravel business.

Mechanizes Crushing

SHENANDOAH VALLEY LIME AND STONE CORP., Winchester, Va., is mechanizing its limestone plant with the installation of a 24- x 36-in. Gruendler jaw crusher. It has been using hand sledging to break the stone for feeding to the lime kilns. Principal reason for the change is the company's conversion of two of its five vertical kilns to a new type of firing that requires a 6- or 7-in. stone. Hand sledging sized the stone to 12 or 18 inches. This new type of firing was designed by T. C. Taylor of Detroit, Mich.

Start Rock Wool Plant

INDEPENDENT INSULATIONS, INC., Tacoma, Wash., rock wool producers, recently started operations, and has contracted its entire output to Van Waters & Rogers, Inc., Seattle, Wash. It is planned to ultimately increase the present capacity of 40 tons per day to 200 tons daily. The product is sold under the trade name of Feltrok. Officers of the company are: C. J. Rusden, president; Henry Hainert, vice-president; Vern Burch, secretary-treasurer; John B. Bridgford, executive director and general manager; directors, Dr. Chas. W. May, William T. Dunne, and James W. Roberts.

Agstone Quarry

H. B. GRAHAM QUARRY CO., Gladstone, Iowa, is the name of a partnership formed by Howard Graham and Earle A. Kloster. A quarry has been opened on the Ransdell property, and agricultural limestone production is now rated at 200 tons an hour. Road stone and rip-rap also will be produced.

Marquette Displays Label

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., is sending a booth display to current lumber and building supply dealers' conventions to familiarize customers with the company's new trademark. Carrying the slogan, "A Fine Old Product in a New Package," the display demonstrated the distinctive colors that indicate the various types of cement manufactured. Bags containing portland cement have a bright green label, masonry cement is defined with a brick red label, and air entraining cement labels are lettered in orange.

The company expects that dealers will begin to receive cement in these new bags by summer. The design will be applied to their cloth sacks when the necessary material becomes available.

Display showing new cement trademark

Oregon Plants Expand

CRABTREE SAND & GRAVEL CO., Dundee, Ore., plans to move its plant to a new location and buy new equipment, according to Ole Crabtree, owner.

NEWBERG SAND & GRAVEL CO., Newberg, Ore., is buying screening and crushing equipment and a new belt conveyor. It is also planned to add ready mixed concrete.

Dolomite Plant

DRUMMOND DOLOMITE, INC., Sault Ste. Marie, Mich., started operations early in April. C. G. Knoblock, general manager, reported that eventually 1,000,000 tons of dolomite rock will be shipped annually. The quarry, constructed in 1945, is owned by Sheboygan, Wis., and Cleveland, Ohio, interests. These are the same interests who operated the Sturgeon Bay Co., whose operations were abandoned for the new location.

Silica Plants Resume Operations After Strike

SILICA plants in the Ottawa-Wedron, Illinois, area have resumed full scale operations after a strike had closed all plants for a considerable period. The new contract provides for a 15c an hour pay increase, but it does not include clauses on the closed shop, maintenance of membership or the check-off system. The Wedron Silica Co., Standard Silica Corporation and the Ottawa Silica Co., were signers of the contract.

Expand Gravel Operations

THE CURTIS GRAVEL CO., Spokane, Wash., will open up a sand and gravel plant at Ephrata, Wash., according to a local announcement. This company furnished a considerable part of the materials going into the Ephrata air base runways, and also the sand and gravel for the Hanford atomic bomb project.

Completing Gravel Plant

C. H. STEARNS and D. E. DONNER have announced that their $100,000 sand and gravel plant south of Chico, Calif., is nearing completion.

Illinois Limestone Survey

A RECENT PUBLICATION, "Survey of Limestone Producers in Illinois," by Elmer N. Searls, Assistant Professor in the Department of Agricultural Economics of the University of Illinois, makes a study of the limestone situation in Illinois as of the summer of 1945. The survey includes a study of thirteen producers and compiles statistics for their plants on the amount of production, sales price, capital investment, and production costs.

The seven-page booklet points out that the needs of Illinois farmers for limestone have not been met for several years, and it estimates that 50,000,000 tons of limestone will be required to correct soil acidity. In addition, about two tons should be added to each acre every ten years to maintain fertility.

The conclusions drawn in the report are that the present producers are the most logical source of the larger supply required, but they must keep down production costs to meet competition and to continue operations if farm incomes decline and the demand for limestone becomes less. Hired labor, power and machinery are the big items of production costs, which range from 54 cents to $1.57 a ton. An estimate is also made of the original investment required, ranging from $10,000 to $115,000 for a plant.

Gypsum Board Production Up

GYPSUM board shipments in January reached an estimated total of 210,000,000 sq. ft., the highest output in two years. Lath shipments also increased in January and are now estimated to represent over 40 percent of all board shipments.

Unfilled orders on lath, however, were 297,000,000 sq. ft. on January 31, while total unfilled orders for gypsum board reached a new high of 917,000,000 sq. ft.

Adds New Quarry

CONCRETE MATERIAL AND CONSTRUCTION CO., Cedar Rapids, Iowa, will open a new quarry and sand and gravel plant at Sedan, Kans., on lands leased from Joe Brewington and Earl Wintermute. Agricultural limestone will be supplied to Chautauqua county under A.A.A. contracts.

War-Born Sand Concern

PAT & MIKE SAND CO., Hays, Kans., has been organized by Patrick and Michael Unrein, sons of Mike Unrein. The story back of this sand company starts at the end of World War I when Michael Patrick Cahill of Boston and Mike Unrein returned from overseas as Army buddies. Michael Cahill was then married, the father of three girls, but his friend was then single but promised that if he was the father of sons, they would be named Pat and Mike. An account of the formation of the sand company appeared in a Boston newspaper, and Michael Cahill wrote to his friend in Kansas renewing his friendship after losing contact for 28 years.

Rebuild Ballast Plant

GIFFORD-HILL AND CO., INC., Dallas, Tex., has rebuilt a crushed stone plant at Allamore, Tex., which was originally constructed in 1926. Crushed rhyolite ballast is produced solely for the Texas and Pacific Railway for its Texas line. The plant has an entirely new installation of equipment, consisting of a 40- x 42-in. Allis-Chalmers jaw crusher, a Cooper-Bessemer Diesel electric generator system, new screens, secondary crushers, etc.

Construction was under the supervision of Jere W. Higgs, chief engineer and C. L. Holley, plant superintendent, assisted by Joe M. Greer, construction foreman.

New Silica Producer

BRISTOL SILICA CO., Rogue River, Ore., owned by F. I. Bristol, has opened up a granite crushing plant. Poultry grit will be made at the plant which will have a capacity of 120 tons a day. Silica deposits are at Miller's Gulch and the granite crushing plant is at Blackwell Hill.

New Asphalt Plant

SUNNYSIDE GRANITE CO., Richmond, Va., has erected a new asphalt plant on the old quarry location outside Richmond. The new plant is a dual type, producing either hot or cold mixes, and will serve as an outlet for part of the output of the company's quarry at Manakin, Va. Capacity is 500 tons per day.

COMING CONVENTIONS

American Society for Testing Materials. Annual Meeting, Buffalo, N. Y., June 24-28, 1946.

National Industrial Sand Association, Annual Meeting, The Homestead, Hot Springs, Va., May 15-16, 1946.

National Ready Mixed Concrete Association, Annual Meeting, Biltmore Hotel, Los Angeles, Calif., week of March 3, 1947.

National Sand and Gravel Association, Annual Convention, Biltmore Hotel, Los Angeles, Calif., week of March 3, 1947.

California Pipe Meeting

CALIFORNIA Associated Concrete Pipe Manufacturers held their twenty-sixth annual meeting at the Fresno Hotel, Fresno, Calif., March 22 and 23, 1946. There were 40 pipe manufacturers in attendance from California, Oregon, Arizona, Nevada, and New Mexico, and 27 associate members and guests.

Plans for the employment of a field engineer and management problems took up the principal part of Friday's session. With the rapid growth of the industry and the increased demands upon it, members feel it is time a capable engineer be employed to promote quality and take up the many problems confronting the industry resulting from increased business.

During the meeting, various speakers referred to the U. S. Reclamation Bureau's large program of canal lining for the Central Valleys Project, much of which has been placed under contract this year, and the resulting demand for concrete pipe necessary for distributing systems.

Friday evening the material representatives were hosts to a cocktail party followed later by a dinner dance at which no speeches were allowed.

Saturday morning the convention concluded its work by discussing technical matters including culverts and septic tanks, and the election of officers.

New officers elected for the ensuing year are as follows: H. W. Chutter, president; Fred Linn, vice-president; and Hugh Pollard, secretary-treasurer. The next meeting will be held in Reno, Nevada, in October, 1946.

Rebuild Granite Quarry

SOUTHERN AGGREGATES CORP., Raleigh., N. C., is planning to rebuild its granite quarry and crushing operation at Wilson, N. C. Bryan-Monroe Co., Raleigh, N. C., will operate the new plant. The site is the easternmost outcropping of granite in North Carolina and the operation will be used in conjunction with the company's Rolesville plant to supply granite aggregate for the seaboard area of the state. A semi-portable plant has been located at the quarry site, but this will be replaced with the permanent installation of 300 tons capacity.

Open Gravel Pit

CHARLES SLAGLE, Greenville, Ohio, has leased a 97-acre tract of land near Weaver's Station from the Wayne Gravel Realty Co., and has announced plans for the production of sand and gravel in a new plant to be opened July 1.

Form Pennsylvania Agstone Division

PENNSYLVANIA Stone Producers Association held its annual meeting at Harrisburg, Penn., on March 25, with President John Curtin, Sr., presiding. President Curtin, in his opening address, told the members about changes in the articles of incorporation and by-laws to permit formation of an Agricultural Limestone Division of the association. He also referred to changes proposed to the Pennsylvania Department of Highways for the improvement of coarse and fine aggregates.

JOHN L. ROMIG, explosives expert, in his talk discussed new developments in quarry blasting designed to give better breakage, and reduce vibration and back tear.

An open discussion followed on the method and form used by the Department of Property & Supplies for receiving bids on aggregates. The principal objection was the time lost through inquiries sent out by second class mail. Some producers also objected to the insertion of an f.o.b. plant price in each item. Blair T. Hefkin, assistant director of highway purchases was present to answer questions.

J. M. SMITH, representing the Philadelphia office of O.P.A. was present to answer questions. General Manager H. H. Wagner asked about an interpretation of the "price makes class" ruling. Mr. Smith pointed out if the industry could present evidence that the capacity exceeded the demand and that only a small volume of crushed stone was used in building construction, he felt that the O.P.A. would consider favorably a petition for an exemption for the industry. General Manager Wagner of the association was instructed by association vote to make application for the removal of the crushed stone industry from O.P.A. price control.

Mr. Wagner reported that the state highway department had purchased 888,896 tons of crushed stone for its own use during 1945 at a cost of $2.04 a ton, 89,076 tons of gravel at an average cost of $1.85 a ton, and 175,311 tons of crushed slag at an average cost of $2.10 a ton.

Officers elected were: President, John Curtin, Sr.; vice-president, T. C. McPoyle; secretary, Walter H. Fehr; and treasurer, Ellwood Gilbert. Board members elected for the western section, E. A. Weymouth and Paul I. Detwiler; for the central section, W. E. Wilson and Samuel D. Narehood; and for the eastern section, J. P. Peacock and H. M. Binkley.

Agricultural Limestone Meeting

In the afternoon, the first meeting of the Agricultural Limestone Division of the association was held with D. K. Shroyer presiding. Mr. Shroyer said that Pennsylvania ranked first in the United States in the production of crushed stone, and ranks high in the production of agricultural limestone, or roughly 65 percent of all the material used in the Northeast region, which comprises Pennsylvania, New Jersey, New York, and the New England states. Pennsylvania will produce well over a million tons of agstone in 1946.

Other prominent speakers at this meeting were: Dr. J. W. White of The Pennsylvania State College; Robert M. Koch, of the Production and Market Administration, Field Service Branch, Washington, D. C., who told about the Triple A program; Mark Schuman, statistician of Triple A program; Henry A. Huschke, managing director, Agricultural Limestone Division, National Crushed Stone Association; and G. J. Kuhlman, enforcement office of the Lime Law of Pennsylvania. Mr. Kuhlman said that it appeared many companies were making liming materials that his Department knew nothing of. He pointed out that the law clearly states that "if you package and transport liming materials, you must register it with the Department of Agriculture. "Mr. Kuhlman said that 50 percent of the agricultural liming materials produced in 1945 had deficiencies in calcium or magnesium.

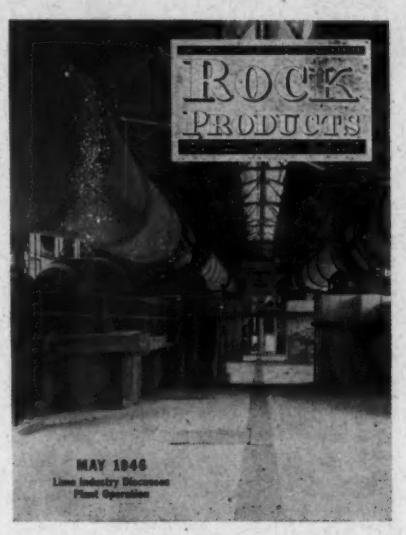
The following officers and directors were elected: Chairman, F. E. Wholaver, Whiterock Quarries, Inc., Bellefonte; vice-chairman, Paul I. Detwiler, New Enterprise Stone & Lime Co., New Enterprise; treasurer, Ellwood Gilbert, New Castle Lime & Stone Co., New Castle; and H. H. Wagner, secretary. Board Members, for the eastern section of Pennsylvania, are George O. Adams, Adams Stone Products Co., Hanover, and William Crook, The J. E. Baker Co., York; for the central section, Robert Garman, Tyrone Lime & Stone Co., Tyrone, and H. M. Binkley, Binkley Bros. & Ober, East Petersburg; for the western section, P. E. Heim, The Carbon Limestone Co., Youngstown, Ohio, and H. W. Lamb, Grove City Limestone Co., Branchton, Penn.

Organize Agstone Concern

MAINPRIZE BROTHERS LIME CO., Thayer, Mo., has been formed by Howard and Otho Mainprize. Crushing and truck equipment has been secured and operations are now under way.

Lease Old Quarry

C. M. PICKERILL and K. L. DILL, Steelville, Mo., have leased the old Midland quarry from George W. Jones, and have spent about $20,000 for equipment.



Kiln room of H. E. Millard Co.

This Month's Cover

FOR THIS ISSUE, containing the report of the National Lime Association convention which considered rotary kiln operation, an interior view of the H. E. Millard rotary kiln plant at Annville, Penn., was selected for our cover illustration. This plant is one of the most modern in the world. H. E. Millard Co. has two 290-ft. Smidth rotary kilns which are equipped with every known device for operation control.

Originally built in 1937 with one kiln of riveted construction but with lime and stone handling capacity to provide for future doubling of capacity, the second kiln, of welded fabrication, was later installed. The kilns are fired with pulverized coal, produce chemical lime and have variable speed.

Gypsum Improvements

THE CERTAIN-TEED PRODUCTS CORPORATION, Chicago, Ill., is planning a number of improvements for the Blue Rapids, Kans., gypsum mine and plaster mill, according to a recent statement by Ed Irvin, plant superintendent.

Expand Quarry Operation

TRIANGLE CONSTRUCTION CO., Fairfield, Iowa, is expanding operations. John Stout, recently resigned Jefferson county engineer, is now in active charge of operations. The company was organized about a year ago. Dan Robbins is superintendent.

New Crushing Plant

STRASBURG LIME CO., INC., Strasburg, Va., is installing a new crushing and screening plant designed by Southern Machine and Supply Co., Roanoke, Va. The new plant will have a capacity of 100 tons per hour and should be in operation by early summer.

HINTS and HELPS

PRACTICAL IDEAS DEVELOPED BY OPERATING MEN

Preventing Spillage

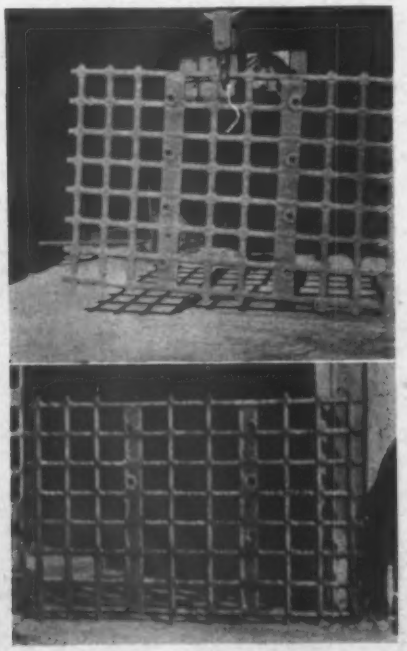
STEELE CONCRETE PRODUCTS CO., Meridian, Miss., prevents spillage of concrete on a belt conveyor from the mixer to the machine by the use of

Flanges welded to hopper confine concrete to the middle of the belt

a hopper with flanges welded along the sides of the discharge opening, confining the concrete to the middle of the belt. As shown in the illustration, the hopper receiving concrete from the mixer above is located almost flush with the belt underneath. A small opening on the side controls the flow of concrete to the belt and the flanges on the side keep it from overflowing the edges of the belt.

Emergency Screen

RADFORD LIMESTONE CO., INC., Radford, Va., was confronted with an emergency during the war when screens were difficult to obtain. In the accompanying illustration is shown a screen which was made out of 1¼-in. drill rod, welded with manganal rod, and hard-surfaced with Amsco Economy rod. The screens, which are 40- x 59-in. for a 5- x 10-ft. Tyrock screen, were made by Ray Lancaster master mechanic. The rods were broken sections too small for use as drill rods.



Screen made from welded drill rod. Note hard-surfacing shown below

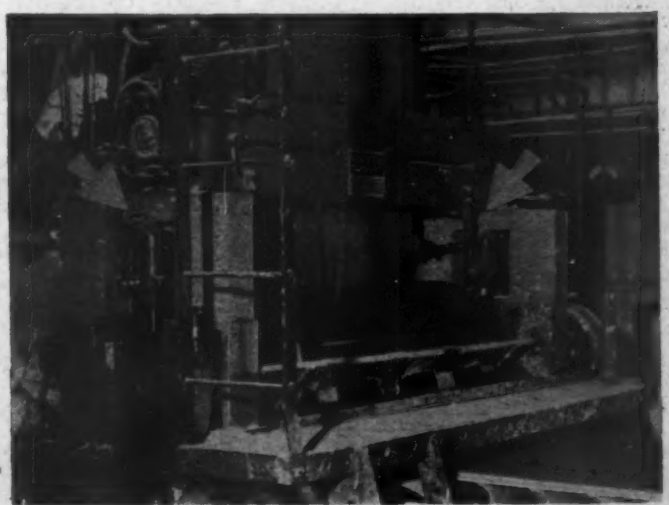
Safety Mechanism for Wallboard Machine

NATIONAL GYPSUM CO., Buffalo, N. Y., has installed on its wallboard machines a safety mechanism which was designed by Carl Cummings and Walter Wetzel, members of the engineering department. The mechanism was developed to eliminate the accident hazard involved working near the master rolls of the board machine. Occasionally a hand would accidentally be caught between them and would be mutilated by the pressure of the rolls.

With the present protection, when a worker feels that his hand is being pulled between the rolls, he nudges a handy wooden trip bar with head, shoulder or hand, whichever is convenient. As shown in the illustration, by pushing down on this bar from any point across in front of the master roll, the cylinders are reversed and the master roll is lifted up.

Previously it was necessary to stop the board machine before a man could free his hand. The new method has the advantage of speed. An added precaution makes it necessary to turn a switch before the rolls assume their ordinary position. Thus, the danger of the roll accidentally coming back down once it is up is removed.

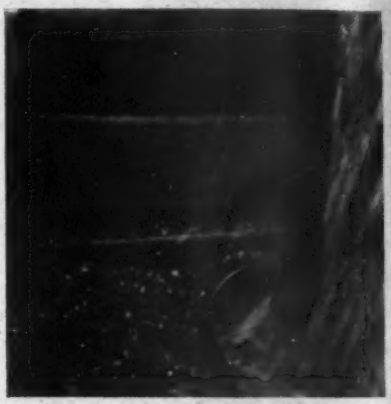
The roll is lifted with the use of air cylinders, a solenoid valve, and an air pressure tank with a check valve that will maintain a constant pressure of 100 lbs.



Arrow points to the place where mechanism which lifts master roll has been installed

Water Flushes Out Gravel

TO FACILITATE movement of gravel to truck loading bins through a 10-in. pipe at a flat angle, the American Sand and Gravel Co., Hattiesburg, Miss., sends a stream of water into the feed end of the pipe. Gravel discharging from a triple-deck screen drops into a hopper from which it



Flood of water from pipe, right, gives gravel an additional washing and facilitates flow of gravel to bins or cars

feeds directly to cars underneath, or can be partially or wholly diverted to the truck loading bins by a baffle board which cuts the flow to the cars and sends it into the pipe. Since the pipe cannot be placed on a steep enough angle to allow gravity flow to the bins, water from a 5-in. pump is sent through a 3-in. pipe into the 10-in. pipe. This also gives the material an additional washing.

Crusher Feed Control

BLUE RIDGE STONE CO., Blue Ridge, Va., has installed an electronic type control on a vibrating feeder to a cone crusher. Material feeds from an overhead bin through the Jeffrey JT 155 vibrating feeder to a Symons 3-

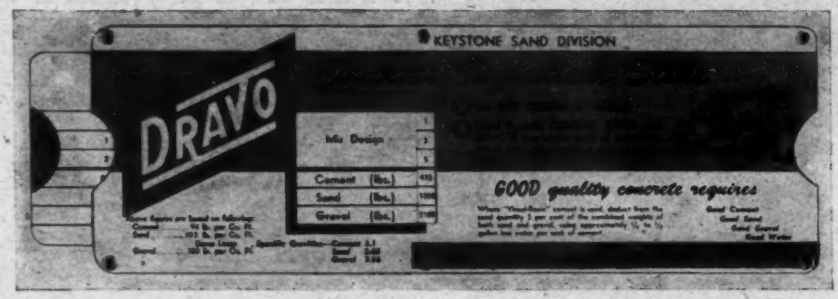
Vibrating feeder to cone crusher

Feed control apparatus, showing electronic control in case with rheostat at extreme right; auxiliary switches and relays in back and motor generator at lower left to convert a.-c. to d.-c.

ft. cone crusher. Trouble had been experienced by material in the bin dropping to the feeder in surges, overloading the crusher motor at times and allowing it to race at others. By means of this electronic control hooked in with the crusher motor and the feeder power line a feeding action is obtained that is similar to the action of an operator watching the crusher and speeding or slowing the feed through a manual control. A type EA-2 electronic amplitude control is hooked into the crusher motor circuit, and it in turn controls a rheostat set in the feeder circuit. Thus, as the crusher motor runs over its rated capacity the electronic control cuts in the rheostat, cutting down the d.-c. current to the feeder. When the capacity drops off, the current to the feeder is cut in.

Concrete Ingredient Scale

DRAVO CORPORATION, Keystone Sand Division, Pittsburgh, Penn., is distributing to its customers an interesting slide rule which can be used



Slide rule to determine quantities in pounds of each ingredient in a given concrete mix design

to quickly determine the number of pounds of cement, sand and gravel in a given mix design designated by numbers. The scale is based on the following specific gravities: cement, 3.1; sand, 2.62; and gravel, 2.56. The cement factor and quantities in all tables change where corrections are made in water content. It will also be noted that the slide rule provides that where Vinsol resin cement is used, three percent of the combined weights of both sand and gravel should be deducted from the sand quantity, using approximately ¼ to ½ gal. less water per sack of cement.

Move and Enlarge Plant

SMITH-KELLEY SUPPLY CO., INC., Mobile, Ala., has moved its block plant to the site of the ready-mixed concrete plant. Capacity has been increased by adding another Besser Super-Vibrapac. Material for the block plant moves up the belt conveyor which feeds the ready mix plant, entering a weigh batcher which also is used for batching ready mixed concrete. From the batcher, the material drops to a 50-cu. ft. buggy travelling on a horizontal track to two mixers located above two block machines. The track, a steel I-beam, is supported on the same framework that supports the belt conveyor. The accompanying illustration, taken before completion of the new plant, shows the method of movement. New curing rooms, nine holding 7200 standard block, have also been built at the new location of the combination plant.

Cash In on IDEAS

• Nearly every plant has devised some method or equipment to reduce maintenance, prevent breakdowns, cut operating cost, improve lubrication or eliminate accidents.

ROCK PRODUCTS will pay you for these ideas at the highest space rates. It isn't necessary to go to much trouble. Merely jot down your idea with a handy pencil or pen, and send us a rough sketch, drawing, or photograph to illustrate it, and we'll whip it in shape for publication. —The Editor.

Cement Loading Dock

CANADA CEMENT CO., Montreal, Canada, has started construction in Port Colborne, Ont., on a new vessel loading dock. Belt conveyors will carry cement to loading spouts at the rate of about 1000 bbls. an hour. The loading dock is being built on the old Welland canal.

Steel I-beam extending, left, horizontally from ready mixed concrete plant will support travelling bucket which will supply concrete to block plant

new MACHINERY

Magnetic Drill Extractor

DINGS MAGNETIC SEPARATOR CO., Milwaukee, Wis., has brought out a magnetic device for removing drill bits, diamond bits, and broken drill

Device for removing broken drill rod

rod from rock drill holes. Made of a high magnetic strength Alnico steel, the drill extractor is said to be capable of lifting approximately 25 times its own weight in vertical lifts, and exhibits unusual holding ability on small and uneven surfaces. It is said that use of the extractor can often save redrilling holes in which drill bits have broken off, or sections of drill rod lost.

The extractor weighs only one pound, and is made in 1¼-in. and 1½-in. diameters. In use, it is fastened to the face of an old drill bit and put into the drill hole at the end of a length of drill rod or wooden pole.

Enclosed Fan-Cooled Motor

GENERAL ELECTRIC CO., Schenectady, N. Y., has brought out a totally enclosed, fan-cooled motor for use in dusty, dirty and corrosive atmospheres. The motor, which is an addition to the Tri-Clad line of induction motors, is available in standard, explosion-proof, and dust-explosion-proof types from 1 to 1000 hp., and can be used where iron dust and metal filings are in the air and in Class I, groups C and D, and Class II, groups E, F, and G hazardous locations. Short in length and compact in construction, the motor can be installed in a small space.

Low starting current, with balanced design, makes the new motor suitable for full-voltage starting, thus permitting the use of simple, inexpensive control equipment. The motor has high pull-up torque for rapid acceleration, and high maximum running torque to meet temporary abnormal peaks and low-voltage conditions.

Totally-enclosed, fan-cooled squirrel-cage polyphase induction motor rated at 5-hp.

Shovel with Unit-Assembly Turntable Design

THE THEW SHOVEL CO., Lorain, Ohio, has announced its TL-20 shovel as a postwar design having many new features. This model can be equipped with a choice of five interchangeable booms and 10 different types of mountings.

An important feature claimed for its turntable design is the unit assembly principle which enables each major component; the clutch shaft, the cab, the engine and accessories, and the hoist shaft, to be removed as a unit and replaced with a similar complete unit. Other features include: one piece, all-welded turntable beds, hook rollers, anti-friction bearings, cut gears throughout with all gears except two intermittently used gears, running in constant oil bath. All five shoe-type clutches controlling the unit are mounted on one unit-assembly and are interchangeable. Roller chains transmit power from this clutch shaft to other functions.

The shovel boom is an all-steel, unified all-electrical welded structure. The square stick also is an all-steel, all-welded unit, the stick sliding in a shipper shaft sleeve which is lined with adjustable and hardened wearing blocks. An electric dipper trip is provided.

This model may be mounted on either crawler or with rubber-tire mountings. The crawler mounting is a chain drive unit with two speeds available in both directions. Rubber-tire mountings cover all combinations and types of four and six-wheel units, with or without front wheel drive, in two-engine Moto-Cranes, and single-engine, self-propelled units.

Shovel designed for interchangeable booms and ten different types of mountings

Truck Mixer with Rapid Water System

THE JAEGER MACHINE CO., Columbus, Ohio, has developed a truck mixer with a water system which is said to insure fast, uniform distribution of the specified mix water to the batch under all operating conditions. This is accomplished by the development of a clog-proof water jet which solves a problem in high discharge truck mixers where the water outlet is submerged in the material and subject to clogging by grout. Pressure for the water line is supplied by a standard Jaeger pump. Use of pump pressure also permits eliminating the overhead tank required with gravity

Mixer truck with mix and flush water tanks mounted on the main frame

operation. Mix and flush water tanks in this model are mounted solidly on the main frame.

Conveyor Trolley

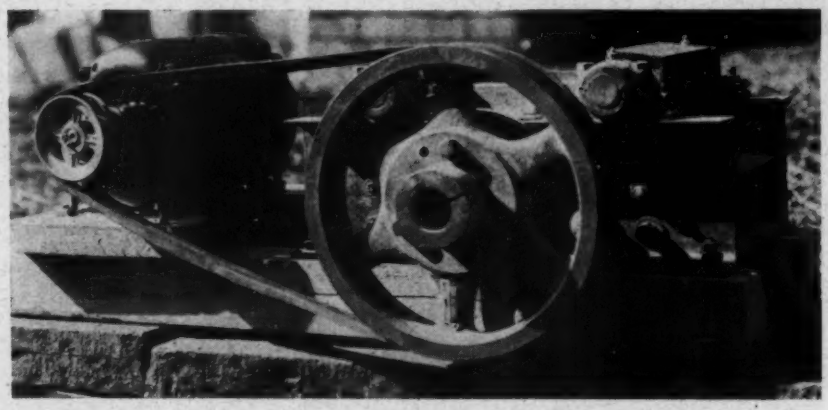
LINK-BELT CO., Chicago, Ill., has developed a free-rolling conveyor trolley which has no wheel shafts or spindles, and does not require separate retainers for its full complement

Wheel and one-piece bracket form the inner and outer race of ball bearings of I-beam trolley

of hardened, accurately balanced steel balls.

The cut-away illustration shows the wheel and one-piece bracket which form the deep inner and outer races of the bearing. The inner bearing race, being a part of the wheel forging, revolves within the outer race formed by the head of the trolley bracket. Bearings are assembled by holding the wheel in position on the head of the bracket and then dropping the balls into race-groove through a ball-loading hole at the back of the bracket. When the race is filled with balls, a plug is inserted into this hole. The plug provides an open hole for lubrication either manually or an automatic system.

The lower ends of the two brackets are connected by two bolts, and have horizontal flanges between which the trolley is joined with conveyor chain link. The one-piece brackets transmit the weight of suspended load directly from supporting clevis to the ball bearings as they do the load resulting from chain pull on vertical curves, without the use of intermediate elements.



Pilot model of crusher which has an oscillating roll between adjustable jaws

Center Roll Crusher

ADAMS ENGINEERING CO., Monticello, N. Y., has developed what is called a "center roll" crusher having some unique features. It has been designed for operation in crushed stone and sand and gravel plants and for mining operations, and is said to be particularly suited for portable plants.

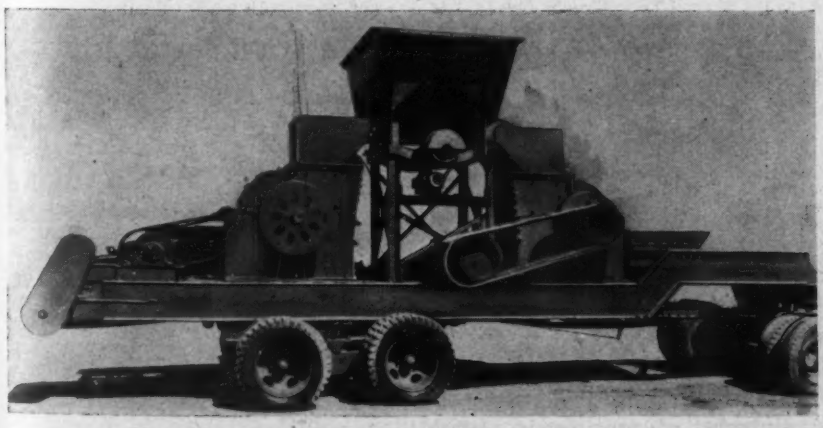
Crushing is accomplished by an oscillating roll between adjustable jaws. It is claimed that any type of material that can be successfully handled by a gyratory can be processed with the center roll crusher. Sizes and capacities to suit a wide range of application will be available.

Among other features claimed are: rotational balance, which permits high speed with minimum vibration; protection from choking, packing, and tramp iron; wide range of adjustment; easy renewal of manganese parts; forced feed circulating oil lubrication; direct drive with flat or V belts; and welded steel frame.

Portable Agstone Plant

UNIVERSAL ENGINEERING CORPORATION, Cedar Rapids, Iowa, has designed a portable pulverizing unit for rapid production of agricultural limestone. It comprises a feed hopper with mechanical plate feeder which feeds material uniformly to the two Universal pulverizers mounted on the chasses beneath, one on each side of the hopper.

Pulverizers of various sizes are available on this unit. The pulverizers have V-belt drives and reversible manganese steel hammers and liners. Crushed material is conveyed by channel frame under-conveyor. The rugged gooseneck chassis is built with dual tires and rear axle equalizer. It can be obtained as a semi-trailer or as a full truck.



Portable tandem pulverizer unit for agstone

Demand-Type Oxygen Mask

MINE SAFETY APPLIANCE CO., Pittsburgh, Penn., has announced the production of a new demand-type oxygen mask for respiratory protection in unbreathable atmosphere. The mask is a cylinder-type oxygen breathing apparatus which requires no special training or practice for operation; the wearer needs only to put on the mask, open a valve, and breathe.

Two types are available. One has an oxygen cylinder on the wearer's back and contains enough oxygen for one hour's normal breathing supply; the other has a front sling with a smaller cylinder for shorter periods. A demand regulator provides oxygen as needed by the individual wearer.

The mask is equipped with a pressure gauge which indicates the amount of oxygen in the cylinder at all times. The breathing tube is quickly disconnectable for conservation of oxygen during stand-by periods. Fogging of the facepiece is prevented by a flow of oxygen.

Conveying

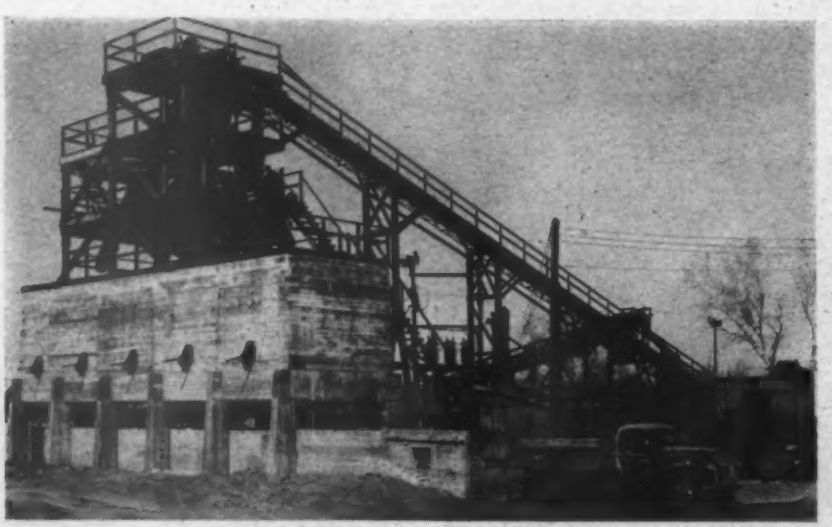
Push-Button Operated Gravel Plant

General view of plant showing conveyor belt feeding scalping screen, the primary jaw crusher in the foreground, and conveyor belt to the top of the bins. In the middle foreground may be seen the belt conveyor which returns secondary cone crusher product to the main belt conveyor

Union Rock and Material Co., Phoenix, Ariz., designs plant to permit control of all operations by one man located at central point

With rapidly growing demands, the old plant of Union Rock and Materials Co., Phoenix, Ariz., proved to be inadequate and work was started on a new plant in the Spring of 1945 with completion in the Fall. The modern streamlined plant is located on the Salt River about three miles south of the city. Walter Bartol is the owner, and R. Glen Jones is plant superintendent.

The plant serves not only the building and highway requirements for the adjacent area, but also produces all the sand and gravel for the concrete block plant which the company operates on the site. Mr. Bartol was one of the pioneers in the concrete block business in this area. In addition to the above activities, the company makes mortar for the building industry.



Reinforced concrete bins with side discharge gates, superstructure with ample room for vibrating screen, sand drag, and conveyors

With everything above the ground and in easy vision of the operator, one man is able to take care of the plant operation. Start and stop push buttons are so located that operations may be controlled from one central point or from auxiliary points where deemed necessary. Water for washing is taken from the well on the site.

Sand and gravel are of excellent quality, having high Rattler and Ottawa tests. Materials excavated from the river bed by means of a ¾-cu. yd. dragline are loaded into dump trucks for delivery to the plant. Trucks dump into a 40-ton hopper over which is a grizzley with 12-in. openings to limit the size of the material going to the primary crusher.

Plant Flow Sheet

Material is fed from the hopper by means of a 24-in. x 5-ft. heavy-duty reciprocating plate feeder which is driven by a 5-hp. Vari-Speed with a speed variation of three to one. This enables the plant operator to change the feed to the plant to suit the pit variations. The feeder can be set from 30 to 90 tons per hour.

The feeder delivers the run-of-pit sand and gravel to a slow moving, low slope, 30-in. troughed belt conveyor, 64½-ft. centers, which delivers the material to a 3- x 8-ft. single-deck vibrating screen having 1¾-in.

Above: Belt conveyor feeding scalping screen, primary jaw crusher, and main belt to top of plant. Left: Main conveyor belt to top of bins, and to the right, 2-ft. cone crusher and return conveyor belt

square openings. Fines go through the scalping screen with the oversize materials going over into a 14- x 24-in. Cedarapids all-steel jaw crusher. These materials are gathered together by chutes and delivered to the lower end of the main 20-in. conveyor belt, 141-ft. centers, on an 18-deg. slope, which elevates the gravel and sand to the top of the plant.

Materials are then washed and graded into the various sizes by two 3- x 8-ft. double-deck vibrating screens. The oversize rock from the top screen goes by gravity direct to a 2-ft. Symons cone crusher for recrushing. Sand from the lower screen is laundered with the water to a 2- x 12-ft. belt sand drag. By changing the mesh on the sand screen the operator can make washed plaster sand or concrete sand. A flop gate at the discharge end of the sand drag permits the sand to be dropped into either of two bins.

The 2-ft. cone crusher throughs go to a 16-in. troughed conveyor, 89-ft. centers, which returns crushed materials in closed circuit to the main belt conveyor.

Reinforced Concrete Bunkers

The main storage bunkers are constructed of reinforced concrete with ample clearance below for loading the largest trucks. Quadrant bin gates are located on the side of the bins so that material at a future date can be fed to a belt conveyor, into a truck, or placed on the ground for

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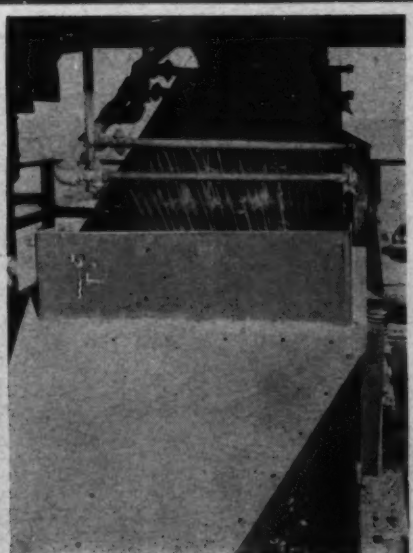

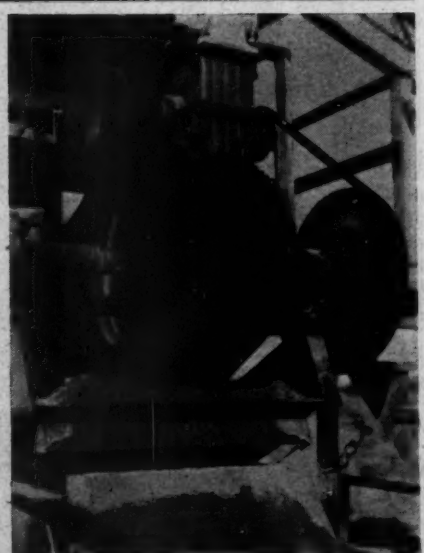

Left: Drive to reciprocating plate feeder. Center: Upper deck of double-deck vibrating screen. Right: Discharge end and drive for sand drag

Hard Surfacing

Prolonging LIFE of Equipment

Petoskey Portland Cement Co., employs hard-surfacing on all parts subject to heavy wear

DIFFICULTY in obtaining new equipment and parts during the war years has brought hard-surfacing of wearing parts in machinery into its own as a cost-saving and time-conserving operation. Taking advantage of this method of prolonging the life of wearing parts, the Petoskey Portland Cement Co., Petoskey, Mich., has realized a saving on parts, spending about 20 percent of the amount that it would have cost to purchase new parts. Records have been kept which substantiate the fact that hard-surfacing has effected this saving as well as prolonging the life of the original parts.

Experience gained during the period of applying hard-surface coating has produced a system of maintenance which is both efficient and thorough. The following describes how various parts are treated to show the extent to which this company has gone in achieving efficiency in hard-surfacing.

At present, about 40 separate equipment parts are coated with hard-surfacing material, including Bradley-Hercules mills on cement clinker, Raymond bowl mills on slack coal, and steam and electric shovels.

Clinker Mill Parts

The Bradley-Hercules mill parts which are hard-surfaced include: rolls, die rings, plows, and spouts. New rolls are made of forgings machined to size. They are then coated with two layers of hard-surfacing of about ⅛-in. thickness each or a total of ¼ in. The first layer is applied in beads of about 1 in. in width, as vertical bars around the periphery of the rolls, and the second layer in beads of about the same width around the periphery of the roll, as rings. The bead rings of the second layer extend around the edge on the lower face of the roll to the bore, and over the edge on the upper face of the roll to a point clearing the flange of the bearing housing. The average amount of metal required to coat one roll with two layers is 40 lb., and the average amount needed in recoating is 18 lb. Recoating is done when the outside layer of hard-surfacing is fairly well worn away. When this is evident, the roll is removed and taken to the shop for recoating. Recoating is done before the original hard-surfacing has completely worn away to protect the soft core of the roll.

Die rings are of a special analysis for hard-surfacing. They are coated with two layers of about ⅛-in. thickness or a total of ¼ in. The first layer is applied in the same manner as that on the rolls; namely, in beads about 1 in. wide as vertical bars around the inside of the ring, and the second layer in beads of about the same width around the inside as rings. The average amount of metal required to coat one die ring is 105 lb., and the average amount in recoating is 90 lb. The wear on the rings is checked periodically and as soon as the wear breaks through the hard-surfacing at any point, this point is recoated with the ring in place. When the hard-surfacing has become worn evenly down to a minimum, the ring is removed from the mill and sent to the welding shop where it is given a new wearing surface of two full layers. With this procedure, a ring will last about 6 months (3000 hours) with one application of hard-surfacing.

Left: Die ring before resurfacing with an electric welder

Below: Compeb mill feeder after resurfacing

A ring taken to the shop for hard-surfacing is set up in a vertical position in a welding-rack built expressly for this purpose. The rack places the ring in a position comfortable for the welder, who can work in a sitting position, and at the same time, it allows the ring to be rolled easily. After the first layer of ⅛-in. beads are applied as bars 1 in. wide across the face, in three beads, or 3 in. of the circumference of the ring, it is then rolled 180 degrees and the second width of 3 in. is applied. When this has been done, the ring is again rolled another 90 degrees and the third width of 3 in. is applied. When this is done, the ring is rolled again another 180 degrees and the fourth width of 3 in. is applied. The ring now should have four 3-in. wide spaces covered and spaced 90 degrees apart. The process is repeated placing the fifth 3-in. width alongside the third, and the eighth alongside the fourth, repeating the process of application until the first layer has been completed. In applying the second layer, the welder runs a single bead ⅛ in. thick by 1 in. wide and about 18 in. long around the periphery of the ring, at right angles to the first layer, then rolls the ring 180 degrees and applies the second 18-in. long single bead. When this has been done, the ring is rolled 90 degrees and the third 18-in. long single bead is applied. The ring is then rolled 180 degrees and the fourth 18-in. bead is applied. The fifth 18-in. single bead is added to the end of the first and the process repeated as with the first layer until the first ring of hard-surfacing has been applied after which the process is repeated for the second bead ring and so on until the second layer of hard-surfacing has been completed.

The time required to apply two layers of ⅛ in. thickness each should require 16 hours for the Bradley-Hercules rings and 12 hours for the Raymond bowl mill rings. Applications have been made in four hours less time per ring, but the result was a slightly distorted ring due to overheating.

Spouts, made of manganese steel, are hard-surfaced on the nose end with one layer. The hard-surfacing is applied in beads of about ⅛-in. thickness and 9-in. wide around the nose end, and extending up the wearing face as rings to a distance of about 5 or 6 in. It carries over the lower wearing edge and over the underside of the spout, with a double layer at the tip. The amount of metal required per spout is about 10 lb., with the same amount required for recoating.

Plows are hard-surfaced over the top surface and ends with a layer of ⅛-in. thickness. The top layer carries over the cutting edge of the plow and continues along the underside a distance of about 3 in. A second layer is applied over the cutting edge extending back a distance of about 2 in. on both top and bottom. About 3½ lb. is required for the initial application and subsequent coatings.

Surfacing Coal Mill Parts

Rolls of the Raymond bowl mills are made of the same material as those of the Bradley-Hercules mill and are coated in a similar manner. The new rolls require about 28 lb. of metal and a recoating job requires about 20 lb.

The die rings of the Raymond mills are of a special analysis for hard-surfacing. The procedure is the same as that for the Bradley-Hercules die rings, except that these rings, after hard-surfacing, go through the whole operating season without being replaced. About 48 lb. is required for the initial application and about 40 lb. for recoating.

Build Up Worn Dipper Teeth

The only parts hard-surfaced on the steam and electric shovels are the dipper tooth points. Three beads of about ⅛ in. thickness and 1 in. wide are applied across the 5½-in. width and back from the cutting edge on both top and bottom sides. This is followed by a second layer of two beads out from the cutting edge. Both ends of the points are covered with one layer of hard-surfacing a distance out from the cutting edge to a point in line with the outermost edge of the beads in the first layer on the top and bottom surfaces of the tooth point. The amount of metal required to coat one tooth point is about 1½ lb.

This company has noted that since using hard-surfaced forged steel rolls in the Bradley-Hercules mills, the trouble caused by roll breakage has been eliminated, a condition that existed when using chilled iron rolls. As a general rule, when chilled iron rolls broke, bearing brasses, shafts, and sometimes plows, spouts, screens, and the main shaft were lost or damaged. Hard-surfaced wearing faces of rolls and die rings also wear straight. They do not wear hollow and face-ends do not beak away as they do in the chilled iron rolls and rings. Both Coast Metals hardfacing weld rods and Stoody hardfacing alloys are used in the shop.

Welder applying hard surfacing to die roll

Die roll ready for resurfacing. Note holes worn in center of roll

The hard-facing operations are conducted under the general supervision of Fred L. Boland, superintendent, and under the direction of John Hegener, master mechanic.

Agstone Project

H. Hoover, who has been operating a limestone crushing plant near Boicourt, Kans., plans to move his equipment to a new locaton. He has purchased the Ray Teagarden farm southwest of La Cygne, Kans., and is planning on a production of 65 tons an hour, about 70 percent of which will be agstone and the balance roadstone.

Lone Star Expansion

Lone Star Cement Co., New York, N. Y., plans to erect at its Birmingham, Ala., plant 14 additional cement storage silos and erect an addition to its packing plant.

Gravel Pit Opened

Estherville, Iowa, will have a new sand and gravel plant in operation when the plant owned by Wm. S. Clark and Jake Johnson gets under way this Spring.

California Block

Cabazon, Calif., has a new concrete block company organized by Larry Ward, Fred Murphy, and H. E. Hutchens.

Controlling QUALITY with X-Ray Spectrometer

New technique to control cement production and to study chemical effects of accelerators and retarders; also used to control calcining of lime

By J. S. BUHLER*

ONE of the most recent control technique developments is the use of X-ray diffraction. Heretofore, diffraction has been somewhat retarded in acceptance due to the need for experienced personnel and also to the time factor involved. By former procedures, hours were consumed in the preparation of diffraction patterns. Recently, however, with the development of the Geiger-Counter X-ray Spectrometer, the time element has been radically reduced so that valuable information regarding structures and physical states of materials can be gained in a matter of minutes. In this advance in the art, the Brown ElectroniK Potentiometer strip chart recorder has played an important part.

Diffraction Fundamentals

To appreciate this recent improvement, a basic understanding of the fundamentals of diffraction is desirable.

When a crystalline substance is exposed to a fine beam of essentially monochromatic X-radiation, a series of secondary reflected beams emerge which have definite spacings and intensities depending upon the atomic structure of the substance irradiated. These beams may be recorded on film. Usually the substance irradiated is powdered and during exposure rotated so that all crystalline planes are exposed in turn to the impinging beam. One may wonder why this does not result in blurring of diffracted beam traces. This is readily explained by the fact that X-ray reflections from crystalline planes are critical; i.e., emerge at certain specific angles only.

The reason for this is perhaps more easily understood if one recalls that a crystal is an orderly arrangement of particles in space in a sort of a three dimensional lattice, as shown in Fig. 1. Such a space lattice has planes in which the particles are more abundant than elsewhere and these planes may be inclined at various angles.

Fig. 2 shows a regular arrangement of such particles and one set of planes that can be drawn through them.

If *A* and *B* are two rays from the incident beam of X-rays which are partially reflected at *P* and *Q*, it is evident that ray reflected at *Q* will be behind the ray reflected at *P* when it emerges from the crystal by a distance equal to *LQM*. If this distance *LQM* is not a whole number of wave lengths long then the radiation

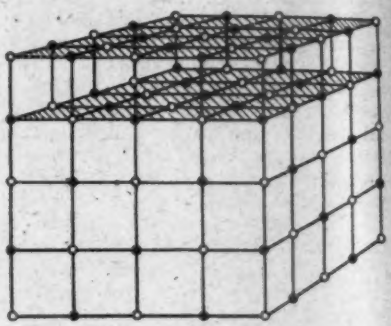

Fig. 1: Orderly arrangement of atoms in crystal

reflected at *Q* will not be in phase with that reflected at *P* in the reflected beam, and some degree of destructive interference will take place between the two reflected rays. As a matter of fact, if the distance *LQM* is an odd number of half wave lengths long then the ray reflected at *Q* will be 180 deg. out of phase with that reflected at *P* and complete destructive interference will occur between the two and no emerging beam will be observable.

However, since it is desired that the reflected rays be in phase, it is necessary that the distance *LQM* be equal to an integral number of whole wave lengths and this condition is met only for a definite value of the angle of incidence *Q*. Referring to the figure it is required that $\eta\lambda = LQM$, where η is an integer and λ is the wave length of the radiation.

From the geometry of the above diagram,

$LQM = 2LQ$,

but $LQ = d \sin Q$, where d is the distance between the crystal layers,

hence $\eta\lambda = 2d \sin Q$.

This equation is known as the Bragg equation after its originator, Sir William Bragg.

From this equation it is seen that there is only one value of *Q* for any X-ray wave length being used and atomic spacing *d* that will produce the desired "in phase" condition in the reflected rays.

To record the reflected beams, it is the practice in the classical method, as has been noted, to place a photographic film in proximity to the specimen often surrounding and coaxial with it, as in the popular "powder" camera.

Development of film from a powder camera gives patterns similar to those shown in Fig. 3.

Uses of Diffraction

It will be noted that the various lines have: (1) spacings and (2) intensities. No two crystalline substances have been found to give the same series of spacing and intensities; consequently diffraction patterns comprise an excellent means of

*North American Philips Co., Inc., X-Ray Division, New York, N. Y.

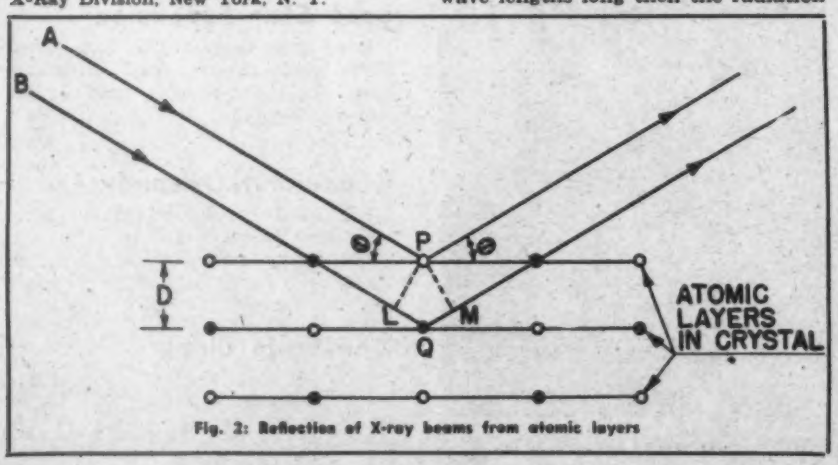

Fig. 2: Reflection of X-ray beams from atomic layers

typing or "fingerprinting." By measurement of the line spacings of an unknown and using the Bragg formula above, a series of "*d*" values can be determined, inasmuch as the wave length of X-radiation is known. Using these "*d*" values and relative line intensities, it is possible to enter tables prepared by the A.S.T.M. where corresponding data are cataloged, with a view to identifying the material. The A.S.T.M. Tables list thousands of substances, and the information they contain is being constantly expanded by the contributions of diffractionists throughout the world.

But identification is only one phase of diffraction's utility. In industry it serves in the important capacity of a "comparator" or "standards" method of quality of control. It is customary in this procedure to prepare standard patterns representing certain acceptable or unacceptable phases or end products. Subsequently, during processing or on completion of a material, patterns are made and compared with "standards," thereby determining the relationship of the product being processed to a desired or objectionable state.

The use of film for ascertaining the locations and intensities of beams, entails considerable loading, exposure, and processing time and gives a full array of lines, whereas frequently concentration on a single line may suffice to give the desired information. Long exposure and film treatment times often preclude the use of this method in processes where minutes count. Furthermore, difficulty is sometimes experienced in attempting to evaluate small line shifts or small changes in intensity, the latter being dependent upon film response characteristics. Obviously, for industrial detection and evaluation purposes, a more rapid, direct-reading, yet sensitive and accurate means are needed.

In consequence, North American Philips research and development groups set out to design a more suitable apparatus. It was felt that a specialized Geiger Muller tube could be designed for diffraction applications. After considerable research and experimentation, a tube was developed with a special filling. This had a quantum efficiency in the order of 96 percent and attained the exceptional quantum counting rate of 2500 to 3000 counts per second.

Fig. 5. Spectrometer and potentiometer strip chart recorder

Thus the Geiger Muller tube which had previously seen service in cosmic ray work, in experimentation with radium, X-ray and ultra-violet sources was developed into a specialized form for spectrometric diffraction.

For the purpose of locating the characteristic beams, it became necessary to establish a definite relationship between the Geiger-Counter tube, as the Geiger-Muller tube is called for this application, and the X-ray source and the specimen. Accordingly, a focusing arrangement was decided upon which was evolved in the form of an analyzer, illustrated in Fig. 4.

With the X-ray source and Geiger Muller receiving slit equi-distant from the specimen, a focusing condition results, permitting the use of a fairly large specimen with sharp line concentration at the pickup. The specimen is geared to rotate at half the angular speed of the scanning arm which bears the Geiger Counter tube and moves over a graduated scale. This maintains the proper Bragg relationship at any point.

Fig. 4. Close-up view of analyzer used with spectrometer

The pulses received from the Geiger Counter are conditioned by electronic circuits, and fed into a frequency meter circuit arranged to drive a suitable indicating meter whose deflections indicate the locations and intensities of lines as scanned. For highly precise work, an electro-mechanical counter with a timing element is supplied.

Without a recorder, it would be necessary to move the scanning arm from station to station, say 0.05 deg. at a time and take a series of readings on the electro-mechanical counter, plotting the values so determined.

However, it was recognized that in

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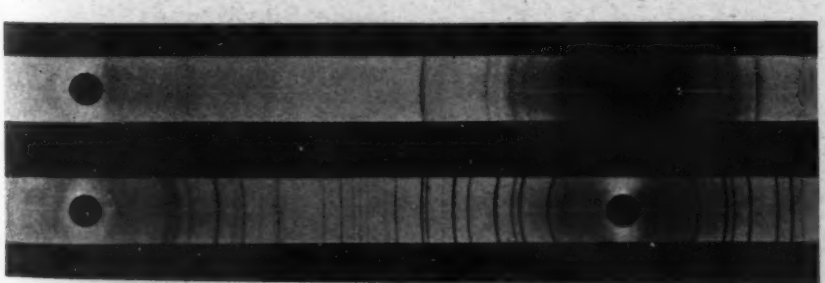


Fig. 3. Diffraction films of a catalyst. Below, (a) poor sample shows sharp lines which are indicative of grain growth and large particle size. These conditions are undesirable; and above, (b) sample of same material in the gamma state in which particles are small with a large surface area. Such a condition is desired in some catalytic conversions to obtain a good yield

Market Concrete in Sacks for Retail Sale

McCrady-Rodgers Co., Pittsburgh, Penn., is a making a dry-batched concrete under the trade name, Macrete

Note dryer and fan, above Dry-mix batching plant.

A DRY MIXED CONCRETE known as Macrete is being marketed by McCrady-Rodgers Co., Pittsburgh, Penn., in small package form through large retailers in Detroit, New York, Milwaukee, and other cities. The mixture is put up in double or triple paper sacks, 36 lb. net, of a 1:2:3 mix. This company also is widely known in the East as a large producer of sand and gravel, ready mixed concrete and concrete block.

A 120-ton partitioned bin, one compartment for pea gravel, the other for sand is mounted above a dryer. The dryer consists of a 6-ft. diameter bare steel drum, equipped with lifter flights, which rotates on its longitudinal axis through a ring gear. Speed of rotation is 10 r.p.m. effected through a V-belt drive from a 20-hp. motor.

A 12-in. pipe entering the cylinder at the discharge end and serving as a carrier for hot air, extends its full length along the axis and is open at the far end to permit the air to come back on the outside of pipe and exhaust at the discharge end of the dryer. Mounted on the outside end of this pipe is a box enclosing steam-heated coils and blower. The blower is an ordinary 14-in. household fan driven by a ¼-hp. motor which blows air past the coils as it enters the pipe. A small oil burning stove mounted below the dryer shell not only makes steam for the coils, but its exhaust heats the outside of the dryer shell. Sand and gravel are dried separately in 2-ton batches. The capacity is 15 tons per day.

Ed. Hutchinson, to the left, in charge of Verona, dry-mixed concrete production

To dump the charge, which must be bone dry, the direction of rotation is merely reversed. A two-compartment hopper receives the dried batches and gravity spouts weigh the two ingredients into sacks as soon as available to prevent re-absorption of moisture after drying.

Yearly distribution is 20,000 to 25,000 sacks, which is the production of the Verona, Penn., plant.

Wet to Dry Operation

W. R. BONSAL CO., Hamlet, N. C., is converting the sand and gravel operation at its Lilesville, N. C., plant from a wet to a dry process. With this change it hopes to eliminate surges and speed up capacity by 50 percent. An Allis-Chalmers blade mill will be used as a part of this installation.

The company is also entering the concrete products business to produce Flexicore reinforced roof slabs and other products. This plant will be erected this summer at the site of the Lilesville sand and gravel operations.

LAWRENCE STONE AND GRAVEL CO., Blanheim, S. C., of which Mr. Bonsal is also president, is erecting a new block plant.

Diversify Products

SCIOTO, LIME AND STONE CO., Delaware, Ohio, is expanding the scope of its operation with the installation of a new secondary crushing and screening plant for crushed stone and sand and gravel. In conjunction with this they are installing a ready mixed concrete plant that will use bulk cement. The company has previously been in the ready mixed concrete business on a smaller scale. The recent installation of a block machine on the plant site will utilize part of the ready mixed concrete output.

More Silo Staves

MARIETTA CONCRETE PRODUCTS CO., Marietta, Ohio, is engaged in an extensive program of remodeling its plant. The program is designed to mechanize most of the plant operations, and will feature the installation of a new Besser machine designed on the Vibrapac principle to produce silo staves. With this new machine the company hopes to obtain four times the capacity of the old plant. The program should be completed by June and will include three 50-cu. ft. mixers, a batcher, and a set of Johnson bins.

Operating Executives of Industry Organize Division of N.L.A.

THE 28TH ANNUAL CONVENTION of the National Lime Association at the Homestead Hotel, Hot Springs, Va., March 28-30, was notable chiefly in that at long last the operating executives of the industry were given an opportunity to discuss their problems of production. For the last several years practically all the attention of the Association has been focused on sales, promotion and research problems. The operating men made good use of their allotted time on the program, and even passed up an afternoon of golf for a further, unscheduled meeting.

The other event of most importance was the selection of a new general manager — ROBERT S. BOYNTON, a chemical engineering graduate, who has made a very favorable impression in the industry through his work on the government War Production Board. S. WALTER STAUFFER, who has been president and general manager of the Association for the past ten years, resigned as general manager, but will continue as president for several months while the new general manager is "learning the ropes." In recognition of his splendid and faithful services during such critical times, the directors of the Association presented Mr. Stauffer with a sterling silver humidor, on the cover of which are facsimile engravings of the various directors' signatures. MRS. ROMA MEDFORD TURPEN, who has long served as assistant secretary of the Association, was made secretary and assistant treasurer.

Elected Officers and Directors

K. L. HAMMOND, Keystone Lime Works, Keystone, Ala., was reëlected chairman of the board of directors; JAMES H. MCNAMARA, Eagle Rock Lime Co., Eagle Rock, Va., reëlected treasurer and the following were elected members of the executive committee, in addition to the chairman: REED C. BYE, Warner Co., Philadelphia, Penn.; HENRY LA LIBERTE, Cutler-Magner Co., Duluth, Minn.; WALLACE E. WING, Marblehead Lime Co., Chicago, Ill.; FRED WITMER, The Ohio Hydrate & Supply Co., Woodville, Ohio.

Directors elected by the members in their respective districts are: District 1, C. C. LOOMIS, New England Lime Co., Adams, Mass.; District 2, H. D. BRIGSTOCKE, Thomasville Stone and Lime Co., Thomasville, Penn.; BOLTON L. CORSON, G. & W. H. Corson, Inc., Plymouth Meeting, Penn.; E. D. WILLIAMS, H. E. Millard, Annville, Penn.; District 3, AMOS B. MINER, National Gypsum Co., Buffalo, N. Y.; RALPH L. DICKEY, The Kelley Island Lime and Transport Co., Cleveland, Ohio; REED C. BYE, Warner Co., Philadelphia, Penn.; District 4, J. A. DUNAWAY, Peery Lime Co., North Tazewell, Va.; District 5A, W. W. SPRAGUE, National Mortar and Supply Co., Pittsburgh, Penn.; FRED WITMER, Ohio Hydrate and Supply Co., Woodville, Ohio; District 5B, RUSSELL RAREY, The Marble Cliff Quarries Co., Columbus, Ohio; District 7, WALLACE E. WING, Marblehead Lime Co., Chicago, Ill.; District 8, CARL H. RUEDEBUSCH, Mayville White Lime Works, Mayville, Wis.; District 9, HENRY LA LIBERTE, Cutler- Magner Co., Duluth, Minn.; District 10 and 11, K. L. HAMMOND, Keystone Lime Works, Inc., Keystone, Ala.; District 12, PAUL SUNDERLAND, Ash Grove Lime and Portland Cement Co., Springfield, Mo.; District 13, G. E. ROBINSON, Austin White Lime Co., McNeil, Tex.; District 14, PAUL H. MCMILLIN, Roche Harbor Lime & Cement Co., Roche Harbor, Wash.; District 15, T. R. ELLERBECK, Utah Lime and Stone Co., Salt Lake City, Utah.

Business

The first morning session and the final session were devoted largely to the ordinary business of the Association, with K. L. HAMMOND presiding as chairman. Mr. Hammond, in his brief opening address, referred to the last previous convention of the industry in 1942 (since then there

Officers and directors of the National Lime Association at the recent annual meeting at Hot Springs, Va. Top row, left to right: Fred Witmer, executive committee; C. C. Loomis, director; Amos B. Miner, director; Wallace E. Wing, executive committee; W. W. Sprague, director; Bolton L. Corson, director; Ralph L. Dickey, director; J. A. Dunaway, director; and Paul Sunderland, director. Bottom row, left to right: Roma Medford Turpen, secretary; S. Walter Stauffer, president; K. L. Hammond, chairman; James H. McNamara, treasurer; and Reed C. Bye, executive committee

have been only open board meetings). He expressed the opinion that a great deal of valuable material had been developed in the Proceedings of the Association that members were not making full use of. He commended the executive committee and the board of directors for the job done during the war and paid a special tribute to S. Walter Stauffer for his management of the Association during these times.

S. WALTER STAUFFER, retiring as general manager, reminded his audience that this was the 44th annual meeting of the Lime Industry. He reviewed the last few years, asserting that the industry had assumed its full responsibilities as producer of a critical war material with credit to all concerned. He mentioned the excellent financial condition of the Association and urged a continuity of the activities in which it is now engaged. He said the Association, during the war, had deliberately increased research and decreased office personnel, with the result that much valuable fundamental research had been accomplished together with a considerable increase in cash assets. Mr. Stauffer reviewed briefly what he had accomplished for the industry through his contacts with government bureaus and departments, all of which was beneficial to non-members as well as members of the association.

The final business session adopted the usual resolutions, and a very considerably larger budget. On a motion made by IRVING WARNER, Warner Co., Philadelphia, Penn., S. Walter Stauffer was unanimously elected an honorary member of the Association for life.

Operating—Rotary Kiln Rings

In the absence of RUSSELL RAREY, who was scheduled to be chairman of the operating session, the group elected IRVING WARNER temporary chairman. (Russ Rarey, unfortunately, was in a Columbus hospital at the time for an operation for appendicitis.) In spite of many outdoor distractions this session was well attended and aroused much enthusiasm for a continuation of a special division of the Association to meet at least twice a year to discuss problems of operation and manufacture exclusively.

H. M. BEATTY, vice-president, The Kelley Island Lime and Transport Co., introduced the first subject for discussion, "Rings in Rotary Kilns." He discussed the theory of ring formation—a slag of coal ash and lime—and how the temperature at which rings form varies according to the percentage of lime in the slag. The fusion or eutectic point of the mixture thus enters the problem. The research laboratory of the Kelley Island company is studying this subject, and trying to find the proportions of lime, silica, iron and alumina, which appear to give the most or the least trouble. Apparently, rings in high calcium rotary lime kilns contain about 60 percent lime, or they are not far from the analysis of portland cement clinker. There is a big difference between the ring-formation in high calcium kilns and sintered dolomite kilns. In conclusion Mr. Beatty described the usual methods of removal by shooting, water lance and Cardox, which latter he had not yet tried.

WALLACE E. WING, president, Marblehead Lime Co., said that fine pulverization of the coal helped prevent ring formation. For removal of rings the customary gun using solid shot had been tried with considerable success. A certain technique in the use of the gun was necessary; in his case they used the gun to cut channels at opposite ends of the same ring diameter. This destroyed the key in the arches of the ring and caused it to collapse. Mr. Wing also emphasized the importance of the percentage of ash in the coal used; with 7 to 8 percent ash there was little trouble; with 9 to 10 percent considerable trouble. He said that eutectics had a lot to do with ring formation and referred to the articles by L. A. Dahl, research chemist, Portland Cement Association, which were published serially in ROCK PRODUCTS, 1938-'39, on "Phase Composition of Cement Clinker," as the best source of information on the eutectics of lime-kiln ring formation. He also thought there were possibilities in petrographic studies of the ring compositions.

ROBERT A. TEMPLE, vice-president, Marblehead Lime Co., supplemented Mr. Wing's description of the method of shooting out the rings. He said the practice was to cool the kiln for about one-half an hour, and then to shoot a channel through it in one place; to shoot at the best angle available. The length of the ring—kiln-wise—makes a lot of difference; with a short ring the gun is very effective, but if the ring is as long as 15 ft., lengthwise of the kiln, little can be accomplished by shooting at it.

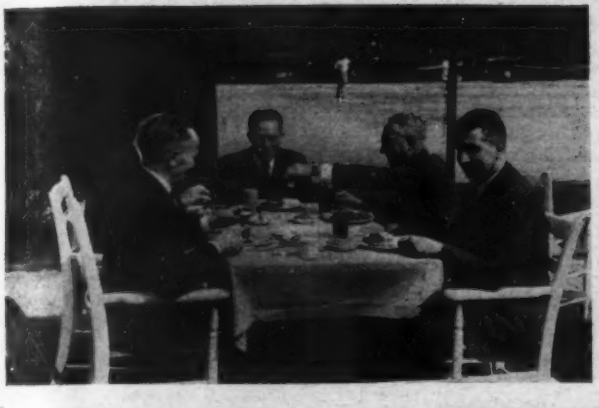
DEAN D. CRANDALL, vice-president in charge of research, National Gypsum Co., told of work his laboratory was doing on kiln rings. The temperature of ring formation is quite definite; above and below that temperature not much difficulty is encountered. He thought it might be possible to add something to the pulverized coal—say pulverized lime—which would raise the fusion point of the ash.

IRVING WARNER brought up the interesting point of the different kinds of ash in coal. The part of the coal containing the most ash is the part hardest to pulverize and some of the ash can be gotten rid of by throwing out the coarsest particles. However, this will not work with all coal. Mr. Warner later explained that he considers coal ash in two categories: (1) "organic" ash, which as near as can be determined, is the mineral content of the wood or vegetation that formed the coal; and (2) "inorganic" ash, composed of earthy impurities which got into the coal measures as they were forming. He estimated, for example, that coal contained about 4 percent of inorganic ash, which could be neglected because it was so finely divided it would be blown out of the stack. There might be another 4 percent of inorganic ash, which was the trouble maker. Thus when the ash in coal increased from 8 to 12 percent, this was not a 50 percent increase, but a 100 percent increase of the inorganic ash which gave the ring trouble.

DR. ROBERT W. MCALLISTER, Arthur D. Little, Inc., who does consulting and research for the Mississippi Lime Co., Alton, Ill., said that lime-kiln rings had from 60 to 95 percent of lime in them. He said they were

Left to right: W. W. Sprague, National Mortar & Supply Co.; Wallace Wing, Marblehead Lime Co.; and Walter Stauffer, president, National Lime Association

Out-Door Luncheon — National Lime Association



Snapshots taken of various groups at the very enjoyable outdoor luncheon at Hot Springs, Va., convention, National Lime Association

James H. McNamara, Eagle Rock Lime Co., and treasurer of the National Lime Association, and John J. McInnis, Eagle Rock Lime Co.

partly caused by variations in kiln temperatures; that some coal pulverizers did not have proper feed control and the result was a periodical surge; that the temperature conditions during these short periods had a lot to do with ring formation.

C. B. GEIGER, Marble Cliff Quarries Co., Columbus, Ohio, said that by properly preparing his coal, ash content can be reduced to not over 8 percent, and kilns can then be operated as long as 35 days before ring removal becomes necessary. With the normal coal the kiln could be operated only about 14 days without a shut down.

FRED A. MANSKE, production manager, National Gypsum Co., said that prior to the war he was able to get 45 days' run on his kilns before removing rings; during the war, because he had to use a different coal with a higher ash content, the kiln run was reduced to 15 days. He thought there were possibilities in getting a more uniform pulverized coal feed; 90 to 92 percent through 200-mesh was probably best. He asked for information about the effect of enlarging the diameter of the kiln at the firing end. IRVING WARNER thought that any advantage in a larger kiln diameter may be due to mechanical reasons—simply that the greater the arch span of the ring, the weaker it is.

C. C. LOOMIS, president, New England Lime Co., described a gadget, in the nature of an asbestos curtain, in the kiln, so as to push the burning zone as far back as possible. This prevents the heavy ash dropping out of the flame at the point where rings usually form. This scheme permitted a kiln run of 48 days without stopping for ring removal.

Delayed Action Blasting

W. W. SPRAGUE, vice-president, National Mortar and Supply Co., led off the discussion on experience with a new type of blasting cap, which apparently has great possibilities in solving some of the knottiest blasting problems. Little publicity has been given to this subject up to now. It seems that like many other quarry operators, Mr. Sprague's company became involved in lawsuits over alleged blasting damage to neighboring buildings. Experts of the Atlas Powder Co. helped defend these suits and were instrumental in getting the lime company to try out a new blasting cap known as the "Rockmaster." Mr. Sprague said the results had been highly satisfactory and had not only removed complaints about vibration, but had saved about 50 percent of the prior cost of secondary blasting. A 35- to 40-ft. face is drilled in the customary way with 5-in. diameter well-drill holes. The holes, after loading, are provided alternately with the regular blasting caps and the delayed action caps.

H. M. BEATTY said the Kelley Island company had experimented with similar caps at its Marblehead quarry with much success. He said similar caps were now made by the other explosives companies. JOHN L. RONIC, Atlas Powder Co., when called upon; explained that the delay was a matter of fractions of a second, and could not be detected by the ear. The less trouble from earth vibration was because the wave vibrations of the delayed action blast tend to interrupt or cancel out one another. The caps are placed in the bottom of the holes. The holes are loaded in the usual way, according to burden. Most of the development work on the new blasting cap was done in cement rock quarries in the Lehigh Valley, where complaints about vibrations had been practically eliminated. H. M. BEATTY explained his Marblehead blasting technique in more detail. The first row of holes was fired with the regular caps, the second, third and fourth rows with delayed action caps. This got better breakage of the bottom blocks and required less secondary shooting.

Shaft-Kiln Controls

WALLACE E. WING, president Marblehead Lime Co., led off the discussion on shaft-kiln operation. He covered various familiar points such as the size of stone—4- to 8-in. size probably being best. The stone should not be too closely sized because this reduced the draft. He said there was no place in the industry today for natural-draft kilns. Mr. Wing reviewed the various methods tried for controlling flame temperature — steam, imperfect combustion, Eldred process, and recirculation of hot gases, which he said was the most economical. The kiln drawing and trimming cycle depends on the type of kiln, but short cycles, say 1½ hrs. are often best. There should be quadrant drawing gates so that kiln can be properly trimmed. Mr. Wing said 5,000,000 B.t.u. per ton of lime was a good fuel ratio (about 1:5 on an ordinary coal basis). He said there were not many control instruments that could be applied to shaft kiln operation. Temperature charts of the exit gases were probably the most helpful.

Most of the discussion which followed had to do with experience in operating center-burner kilns with recirculation of the hot gases (Azbe's designs). W. W. SPRAGUE, National Mortar and Supply Co., Gibsonburg, Ohio, said that this method had resulted in reducing his kiln temperatures to about 2000 deg. F. (Ohio finishing lime). He said they were taking off the hot gases at 600 to 700 deg. F. about 20 ft. down from the top of the kiln. BOLTON L. CORSON, G. and W. H. Corson, Inc., Plymouth Meeting, Penn., said that he was converting his Azbe center-burner kilns to use recirculated hot gases. He said he had found that this process gave a much "softer burned" lime.

PAUL SUNDERLAND, vice-president, Ash Grove Lime and Portland Cement Co., said that he used stone up to 10 in. in diameter. His chief trouble in drawing the kilns as continuously as desirable was lack of labor. WALLACE WING said frequent drawing would prevent high temperatures and save on kiln lining. Carborundum is being used as a refractory in center burner construction, but care must be taken in kiln construction and operation to prevent reducing conditions developing around this burner, for that very much shortens the life of the refractory.

Other discussion concerned preheaters and coolers for lime kilns, but no experience data were developed.

Labor Relations

A considerable part of the session (and all of a succeeding session) was devoted to a more or less off-the-record discussion of labor problems which are disturbing all executives in charge of production. F. A. MANSKE, production manager, National Gypsum Co., acted as chairman. Certainly every effort was made by the production executives present to understand the workers' point of view, as well as to express their own.

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Canadian Meeting Reveals War Secrets

Production of lime in rotary kilns, industrial minerals processing in Europe during the War feature meetings of Canadian Institute

APPROXIMATELY 1000 members and guests attended the 1946 annual general meeting of the Canadian Institute of Mining and Metallurgy, April 9-11 at Montreal, Que., Canada, including delegates from the United States who were present at sessions of the Industrial Minerals Division. The Division held separate sessions from other Divisions of the Institute, to hear and discuss papers of direct interest to the rock products industry.

In the inaugural general session, W. H. LOSEE, Chief of the Mining, Metallurgical and Chemical Branch, Ottawa, Canada, reported on "The Mineral Industry in 1945." In his report, Mr. Losee summarized Canadian mineral production for 1944 and submitted preliminary estimates for 1945. Canada's total mineral production was valued at $479,587,911 in 1945 as compared with $485,819,114 in 1944, the declines being in metals and fuel production.

Industrial minerals increased in value by a million dollars and the structural materials group, which includes portland cement and aggregates, increased by four million dollars. Gains were noted in the output of asbestos, barytes, feldspar, graphite, gypsum, nepheline syenite, portland cement and sand and gravel, but production of lime and stone products decreased.

Asbestos production was 460,051 short tons valued at $21,405,391 in 1945 as compared with 419,265 tons valued at $20,619,516 in 1944 and 346,805 tons at $15,619,865 in 1940. The Canadian desposits are, of course, the largest in the world, practically all being of the chrysotile variety and mined from the serpentized rock in eastern Quebec.

Gypsum production increased markedly from 596,164 tons valued at $1,511,978 in 1944 to 822,380 tons valued at $1,928,043 in 1945 which compares with 1,593,406 tons valued at $2,248,428 for the peak year of 1941.

Canada and Russia are the only countries known to produce nepheline syenite on a commercial scale, the chief use being in glass manufacture. Canadian production, from Ontario, has increased steadily from 20,510 tons valued at $117,849 in 1940 to 60,133 tons valued at $236,902 in 1945, which represents an increase of about 14,000 tons over 1944.

Production of portland cement increased from 7,190,851 bbl. valued at $11,621,372 in 1944 to 8,378,341 bbl. valued at $13,908,014 in 1945 which is only about three quarters of a million barrels short of the 1942 war year peak. Lime production, on the other hand, declined from 885,142 tons valued at $6,926,844 in 1944 to 831,982 tons valued at $6,421,347 in 1945. The big bulk is produced for pulp and paper mills and chemical works. Sand and gravel increased from 28,399,986 tons valued at $10,280,119 in 1944 to 29,021,249 tons valued at $10,513,992 in 1945 while stone (presumably crushed) decreased from 5,994,992 tons valued at $7,159,177 in 1944 to 5,884,718 tons valued at $7,577,804 in 1945.

Production of magnesium metal during 1945 came entirely from the plant of Dominion Magnesium, Ltd., at Haley's, Ontario. This plant produced metallic calcium during 1945.

Industrial Minerals in Germany

One of the most interesting papers was a report on the utilization of industrial minerals in Germany by M. F. Goudge, chairman of the Industrial Minerals Division, C.I.M.M., who had spent four months overseas late in 1945 in his official capacity with the Canada Department of Mines and Resources. His trip covered all but Russian-occupied Germany and the countries of Austria and Italy.

Mr. Goudge was impressed with the resourcefulness of the Germans in the manufacture of synthetic minerals, the absence of waste around the plants, the dustlessness and the little tricks in processing that have been developed. While dust collectors were found to be widely used, including in the cement and magnesite plants, he also was impressed with the lack of good quarrying and materials handling equipment, the poor caliber of management (in cement mills particularly) and the lack of attention to labor-saving devices and plant safety generally.

In his trip of 15,000 miles, by Army Jeep, he saw devastation everywhere. Few industries were operating, due to lack of coal and transportation facilities but he found plant personnel generally willing to talk. Germany is rich in industrial minerals, he said, and is accomplishing things with them that are extremely interesting. Much of the synthetic production that he referred to was, of course, born of desperation.

In Italy, where coal was almost totally lacking but where power is plentiful, he observed cement manufactured by the fusion of local porphyry and limestone in a ferrosilicon furnace in an electrometallurgical plant at the rate of 56 t.p.d. The melt, which had the appearance of green water, was air-quenched, cooled, ground and mixed with 20 percent portland cement and the resultant mixture made acceptable concrete.

Wide use was being made of slag; for slag wool manufacture, aggregates, cement manufacture, in the form of foamed slag, for brick manufacture and as fertilizer. Some of the slags have fairly high content of P_2O_5 as well as lime to enhance their value in agriculture. One of the most interesting applications of slag was in the manufacture of cast road-paving block. The slag was poured into a grid and chips were applied for surfacing.

German Mineral Wool Manufacturing Practices

Notable differences from American practices, in the manufacture of mineral wool, were observed. Mr. Goudge said there were marked differences in cupola design. Whereas water-cooled jackets are common in America, water-cooled plates imbedded in thick brick walls were seen in operation. In a plant producing slag wool from slag and coke, with a melting temperature of 2200 to 2500 deg., lining had to be replaced once a year.

He saw mineral wool produced that was almost absolutely free of shot. In this plant the stream of fibers was blown through a pipe to strike a 5-ft. diameter steel ball suspended by a vertical wire rope, and similarly fastened to the floor. Shot dropped to the floor. The ball could be moved to service more than one cupola. At another plant, Gerresheimer Glass Works, Dusseldorf, spinnerettes were employed. The raw material was residue from an oil-shale distillation plant. It was shipped 300 miles and was considered of ideal composition for wool manufacture. This wool, sold in rolls, commanded a 50 percent higher price than glass wool because

(Continued on page 98)

Slag is loaded into cars from pits in foreground and hauled to primary crusher to the left. Crushed slag is carried to main screening plant, to the right, by belt conveyor. Pits are usually more nearly full than shown in the illustration which was taken at Birmingham Slag Co., plant No. 5, Ensley, Ala., during the recent steel strike

ALABAMA—
Rich In Industrial Minerals

Explains why Alabama is chief manufacturing State in the South

By HERBERT E. SWANSON and NATHAN C. ROCKWOOD

TO UNDERSTAND the geology of the industrial mineral deposits of Alabama, one needs first a brief picture of the State's topography. The northeastern part of the State contains the southern end of the Appalachian Mountain range, which extends from Maine to Alabama and Georgia; and the north central and northwestern part of the State, the southern edge of the Appalachian Plateau. In between is a belt of metamorphosed rocks, formed by the squeezing and heating of the original, mostly sedimentary rocks.

In the Appalachian Mountains the rock formations, as elsewhere in this range, are broken and folded, but in the Appalachian Plateau they are mainly in nearly horizontal formations. Both the mountain range and the plateau slope gradually to the south, to the shores of the Gulf of Mexico, to form the outwash or the Coastal Plain, which is of relatively late geological formation. In the northern half of the state are coal, iron ore and limestone, as well as many other industrial minerals; in the southern half, sand, gravel and clay, including combinations of the two in the form of foundry sands. Thus the State of Alabama was ideally equipped by Nature for modern industry.

General Geology

Alabama is divided into three distinct geological regions, each marked by a separate group of rocks—the Crystalline, the Paleozoic and the Coastal. First, the Crystalline Area, covering a belt of "mountain" country about 5000 square miles in the east-central part of the State, and embracing Lee, Coosa, Tallapoosa, Clay, Randolph, the larger parts of Elmore and Cleburne, and small parts of Chilton, Talladega and Calhoun Counties. Practically all the igneous and metamorphic rocks of the State are contained in this area, the most prominent being granites, granodiorites, syenites, "traps," gneisses, and schists.

The Paleozoic Area includes the Appalachian valleys and ridges and the Cumberland (Appalachian) Plateau. It lies north and west of the Crystalline belt, in the north and northeastern part of the State, and covers about one-quarter of the total area of Alabama. This area is characterized by the consolidated types of sedimentary rocks such as limestones, sandstones, cherts, and shales.

Most of the rocks, mountains and valleys of the Birmingham district and northern Alabama were formed in the Paleozoic Era. During the Cambrian and Ordovician periods of this era, the quartzite in Shelby and Talladega counties and the limestone, shale, and dolomitic rocks of northern Alabama were laid down. Shale,

sandstone, and limestone found mostly in the northwestern part of the State were laid down during Mississippian times. Belonging to this period is the oolitic, or Rockwood, quarried for dimension limestone.

In the division of the Paleozoic rocks we find cherts of the Fort Payne and Knox formations; limestones of the Cambro-Silurian (Knox), Ordovician, and Sub-Carboniferous; and the limestones and sandy shales of the Carboniferous and Sub-Carboniferous; and finally the residual sands, clays, and gravels. The Tennessee Valley, which stretches east and west across the State north of the coal fields, is almost entirely in limestone or cherty limestone. The Sequatchee, Wills, Murphrees, Cahaba, and Birmingham valleys are all narrow limestone valleys with either one or both sides paralleled by the Fort Payne chert ridges. The great Coosa valley which is almost entirely in limestone, is interspersed in many places by ridges of chert of both the Fort Payne and Knox formations.

Lastly, the Coastal Plain Area, in the southern and western portions of the State, and occupying more than one-half the total area of Alabama, is characterized by unconsolidated sedimentary rocks such as soft limestones, clays, and shales. Covering about one-quarter of the Coastal Plain Area is the Citronelle formation, composed of rounded quartzite or chert pebbles and ferruginous clay. The gravel deposits vary in thickness up to 50 ft. or more, and are found in various locations covering practically every formation in the State.

The Geological Survey of Alabama has made extensive studies of the minerals of the State, and is ready at all times to assist producers in their problems. Dr. Walter B. Jones is the state geologist.

Belt conveyor coming from recover tunnel at Alabama Aggregates Co., plant feeds flux stone directly to railroad cars

Primary and secondary crushers at the Cobb City plant of Alabama Aggregates Co., are housed at the right. Belt conveyors move stone to screening house to the left with oversize returning by belt conveyor to crusher house. At extreme left is surge silo feeding pulverizer

Quarrying to Supply Fluxstone, Aggregates and Cement Industries

LIMESTONE AND DOLOMITE are available in huge quantities in Alabama, principally around the Birmingham area, where several cement plant organizations quarry the limestone for the production of portland cement, and where the steel companies and commercial producers quarry the dolomite for fluxing material. Some quarries, which supply the steel mills with flux stone, also produce agricultural stone, as well as some concrete aggregate, although limestone and dolomite are used sparsely as construction materials in Alabama. Slag is a dolomite or limestone by-product of the steel mills, and is an important factor in highway construction.

Oldest—Conasauga Formation

Alabama possesses several extensive formations of limestone suitable for portland cement manufacture, together with good deposits of shale, clay, sandstone, and sand, which are also used in cement production. North and northeastern Alabama is largely underlaid with high-calcium limestone of Paleozoic age and belts of rock of similar composition, of Cretaceous and Tertiary age, cross the middle and southern parts of the State. In northern Alabama, in the Tennessee River Valley, are limestones of Ordovician age, mainly the Chickamauga, and of Mississippian age, the Tuscumbia and Bangor limestone. Interbedded with them are shales, clays, and sandstones. In northeastern Alabama, including areas farther south than Birmingham, old rocks such as the Cambrian (Conasauga) and Ordovician (Chickamauga) formations contain high-calcium limestone and shale.

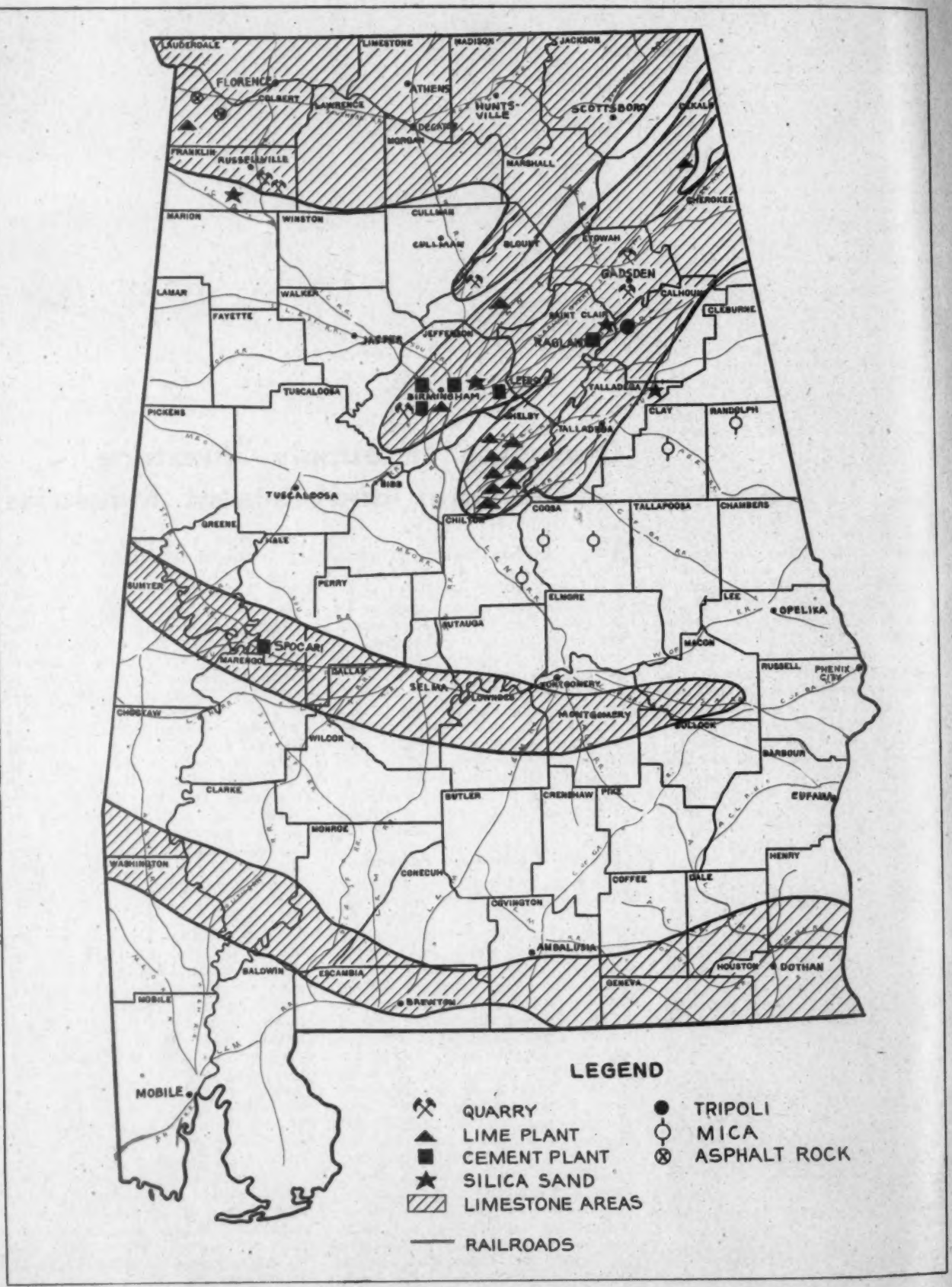
The main area of the Conosauga or "Coosa" formation of the Cambrian System extends from the north end of the Cahaba coal field in St. Clair County via Asheville, Gadsden, and the southern part of Cherokee County into Georgia. A second large area underlies part of the city of Birmingham, and extends southward through Bessemer to the vicinity of Vance, in Tuscaloosa County.

The Conasauga is made up of limestone, dolomite, and shale of varying proportions and in different areas. One strip which occurs from Woodward to Mount Pinson, is mostly limestone. The strip underlying the Birmingham area is composed of mixed limestone and shale with the limestone predominant. The limestone in the western belts is dark bluish, fine-grained, and mostly thin-bedded, with much of it highly argillaceous.

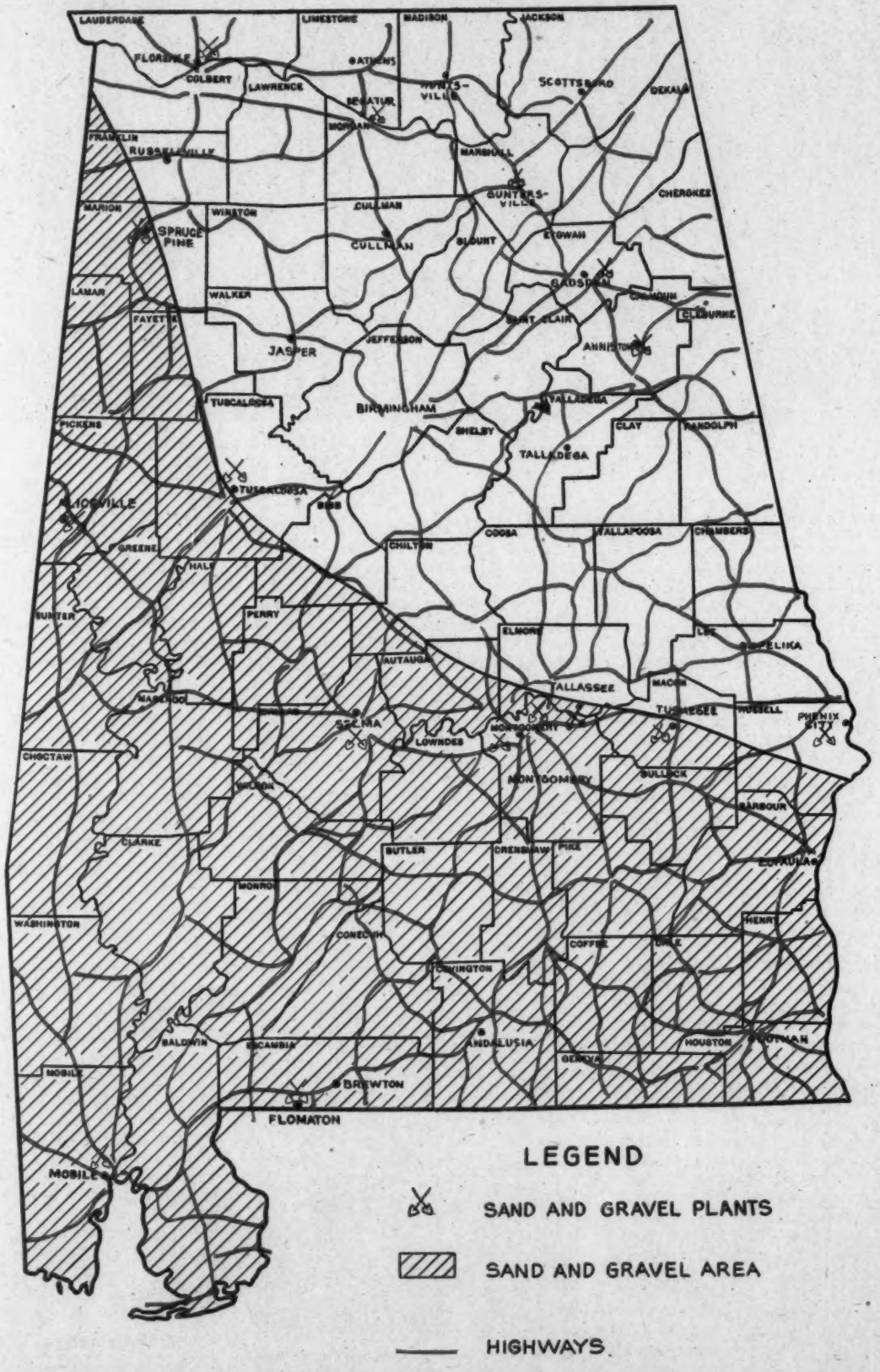
The Conasauga area has been, by thrust faulting, displaced to the northwest an unknown distance, probably several miles, and as it is almost wholly composed of thin-bedded weak rocks it has been intensely crumpled, so that the beds are highly inclined. The thickness of this area is about 1900 ft. in Opossum Valley west of Birmingham, where the bottom is not exposed; about 800 to 1000 ft. in the Montevallo region and possibly 1000 ft. or more in the Columbiana Mountain belt.

Cement plants using stone from this formation are the Lehigh Portland Cement Co. plant at North Birmingham, the Lone Star Cement Co. plant also at North Birmingham, and the Alpha Portland Cement Co. plant at Phoenixville, just south of Birmingham.

The Little Oak limestone, utilized



Map of Alabama showing location of stone deposits, lime and cement plants, silica sand, and other minerals



Showing location of sand and gravel areas and plants in Alabama

Long belt conveyor moves material from quarry to plant at National Cement Co., Ragland, Ala.

for the manufacture of cement by the National Cement Co. at Ragland, is generally a thick-bedded, dark, rather coarsely crystalline limestone. In places it contains a good many nodules of chert, as on the hills half a mile southeast of Pelham, and on the face of the ridge at the quarry.

A certain thickness at the top of the Little Oak is very argillaceous, at least at Pelham, where weathered material just southeast of town is composed of a brownish, fragile mudrock. This is residual from the original argillaceous limestone which has lost its content of lime through leaching. The Little Oak appears to reach its maximum thickness of about 500 ft. along the Cahaba Valley and the Ragland belts. Irregularity of thickness would be expected from the fact that the formation has been subjected to long erosion before being buried by subsequent deposits.

Lenoir, Mosheim and Newala

Raw materials used at the Universal Atlas Cement Co., Leeds, Ala., are from the Lenoir, Mosheim, and Newala limestone of Ordovician age, Floyd shale, and Shades sandstone of the Pottsville formation of Pennsylvania age, and a small portion of iron ore.

The Lenoir limestone is prevailingly a dark, finely crystalline, medium thick-bedded, apparently nonmagnesian or low-magnesian limestone. It contains some clay or other very fine-grained impurities, which are revealed on weathered surfaces as slightly raised gray bands. Thickness of the Lenoir is about 500 ft.

The Mosheim limestone is a thick-bedded, compact, brittle bluish-gray limestone and in texture is a typical Vaughanite. Thickness is not known to exceed 50 ft. in Alabama. Although the Mosheim is a well-defined unit in Alabama, it may have been included in the Lenoir limestone as a basal member.

Newala limestone is one of the best exposed formations in the Paleozoic area of Alabama. It is composed of much limestone and proportionately little dolomite. Most of it is thick-bedded, compact or non-crystalline, dark gray, pearl gray, and bluish gray. The dolomite of the formation occurs either as aggregates of separate layers as much as 20 ft. thick or as interfingerings of dolomite in layers of limestone, which produces a mottled rock that characterizes limestone undergoing change to dolomite by replacement processes. The compact limestone of the Newala is a very pure calcium carbonate. It is about 1000 ft. thick in Cahaba valley where conditions for measuring are the most favorable.

At the Ensley No. 1 plant of Birmingham Slag Co., slag is dumped into primary crusher from 50-ton capacity cars. Skip cars elevated by cable hoist take the slag to the top of the screening plant

Selma Chalk

Selma chalk, otherwise known as "rotten limestone," is a soft material which has a maximum known thickness of 930 ft., and ranges in composition from purer facies that contain 85 percent or more of calcium carbonate to impure chalky clay and sand. The chalk was doubtless formed as calcareous, more or less muddy oozes, which gradually accumulated on the bottom of a clear sea. This outcrop of Selma chalk is about 25 miles wide in western Alabama and gradually becomes narrower toward the east, finally pinching out entirely in Russell County. Of Cretaceous age, the Selma chalk is soft enough to be cut with a knife, and is light bluish when fresh, but weathers to a dazzling white. The Lone Star Cement Co. operates a plant at Spocari, near Demopolis, quarrying the Selma chalk as the main constituent for cement manufacture.

Fluxing Stone

Dolomites are used almost exclusively as fluxing stone for steel mills in the Birmingham district. The steel companies operate "captive" mines for the production of flux stone, and also purchase stone from commercial quarries. Since the stone must be sized for the mills, much of the finer product, or waste, is processed and sold commercially by independent producers as agricultural limestone, dust for dusting coal mines, or fertilizer filler, with a very little being produced as a construction material.

Chickamauga Limestone

One of the limestones that is used for flux is the Chickamauga limestone, of Ordovician age. It includes all the limestones above the Knox

dolomite and below the Rockwood formation, and is an aggregate of limestone deposits that were laid down by seas which invaded the western Appalachian Valley and the interior region at widely separated intervals. Owing to the warping of the earth's crust, the sites of succeeding areas in which the rocks were deposited did not coincide with one another, hence the sequence and ages of the formation of this unit differ greatly from place to place. The Chickamauga formation occurs along the western side of Red Mountain from the northern part of Bibb County, almost to Springville in St. Clair County. There are also several smaller strips occurring on the western side of Birmingham Valley, and some in Murphrees Valley and in the vicinity of Chepultepec. The formation ranges from 300 to 700 ft. in thickness, and is generally thin to thick bedded, light to dark gray in color and semi-crystalline. At Cobb City, the Alabama Aggregates Co. quarries this stone for sale to steel mills, as well as for agstone and construction aggregate. East quarry, affiliated with the Birmingham Slag Co., is also located here, and produces flux stone.

Ketona Dolomite

The largest areas of Ketona dolomite occur in the vicinity of Birmingham, where the formation is extensively exposed in a number of quarries, as at the Thomas quarry of the Birmingham Slag Co., Dolcito quarry, and the Ketona quarry of the Tennessee Coal and Iron Co. (U. S. Steel Corp.) It also occurs in large amount north of Nonfevallo.

The Ketona is a coarsely crystalline, light gray, thick-bedded, dolomite that is remarkably pure. The most distinctive feature of the Ketona is this freedom from chert or siliceous residual material of any kind. In the Birmingham Valley, the Ketona appears to be from 400 to 600 ft. thick. It is of great economic value as a fluxing material for use in smelting the iron ores of the region.

It is of interest to note that practically all of the cement plants of Alabama and the stone quarries producing flux for steel mills are located in the Birmingham area.

Stone for Lime

Lime is manufactured from three formations in Alabama. They are the Newala limestone member of the Knox dolomite, the Ketona member of the same formation, and the Bangor limestone. The Newala has its best development in Shelby County from the vicinity of Calera to Pelham, and is perhaps the best limestone in the State for the production of high calcium chemical lime. This is emphasized by the fact that eight of the eleven plants in Alabama are located in this area.

Material being loaded into railroad cars at the Ensley No. 5 plant of Birmingham Slag Co., is washed and screened. Cars move back and forth as they are being filled to prevent segregation Samples of slag in the cars are taken for tests before shipping

Loading limestone with 1¾-cu. yd. shovel to 12-ton rear-dump haulage units in quarry of Alabama Aggregates Co.

At the Dolcito Quarry, Tarrant City, Ala., 6-ton skip cars take the primary crusher product from the quarry to the main plant

SAND AND GRAVEL COVERS COASTAL PLAIN

THE COASTAL PLAIN of Alabama is the product of the washing away or erosion of the Appalachian Mountains and Plateau, described in the article on Geology. The deposits thus formed are some 1800 ft. thick over the original bed rock. The materials that form this deposit are mostly the durable ingredients of the rock formations to the north, including many chert or flint pebbles dissolved out of the limestone formations.

Dredging operation at the Flomaton, Ala., plant of Dixie Sand and Gravel Co. Sand from 9 to 20 per cent passing 50-mesh can be obtained from deposit with ordinary wooden settling boxes

In addition to the Coastal Plain the present river beds and flood plains or terraces contain sand and gravel deposits, which have been exploited on occasion.

Practically all sand and gravel commercial aggregate operations now in Alabama are found in this Coastal Plain, which is of the Cenozoic era, and is represented by the formations of all the epochs it is customarily divided into; the Eocene, Oligocene, Miocene, Pliocene, Pleistocene, and Recent epochs. All of the Cenozoic epochs occupy an area of more than 17,000 square miles between the southern boundary of the State and the outcrop of the Upper Cretaceous or Gulf series, which adjoins them on the north.

Most of the deposits formed during the Cenozoic era were laid down on the bottom of the sea as sand, clay, mud, or calcareous ooze, and many of them inclose different kinds of sea shells or other marine fossils.

These formations, crossing the Coastal Plain in Alabama, run in belts in a general east and west direction, but swing in a more northerly direction toward the western border. There are seven belts, four characterized by siliceous materials such as sands, clays, or sandstones, and three belts characterized by calcareous or limey materials either of a soft or indurated nature.

Sand and gravel are obtained from loose beds overlying the formations from which they were derived; from the drifted sands along water courses; from the stratified sands of some of the younger formations; from the harder sandstones of the older formations. The best in this latter group is obtained by crushing a friable sandstone of the Lower Carboniferous series at Gate City for glass sand, 99 percent pure silica.

The Tuscaloosa division of the Cretaceous has a practically unlimited supply of all grades of sands, while some parts of the Ripley division of the Upper Cretaceous have some excellent sands, including glass sands. The Tertiary formations which stretch across the southern end of the State contain numerous beds of excellent sand and gravel; many of the sands are well sorted and remarkably uniform, as for example those of the Wilcox group near Camden in Wilcox County and Gaston in Sumter County.

In the territory of the Grand Gulf formation (Washington, Mobile, Baldwin, Escambia, Covington, Geneva, Dale, Henry, Houston, etc.) there is an almost continuous deposit of sand. The Lafayette terraces, which mantle the entire Coastal Plain, are predominantly sand and gravel beds.

Geologically the sands of Alabama are classified as (1) alluvial sands along rivers; (2) alluvial sands along creeks; (3) colluvial sands; (4) sands from weathering of talus; (5) sands from the Tuscaloosa (Upper Cretaceous) formation. There are no sands of glacial origin in the State. Colluvial sands are those formed where weathered materials are removed from their original site by rain.

The Geological Survey of Alabama has published, as Bulletin No. 35, a study of the molding sands of the State, by George I. Adams, which will be found very helpful in any library on molding sands. The screen tests show that there is plenty of fine sand in the State. However, in operating most of the deposits of commercial sand and gravel for concrete aggregates, it would appear that much fine sand is lost, since the finished products appear low in the minus 50-mesh.

Radcliff Gravel Co., Mobile, Ala., has dredge to pump from river. Sand and gravel are separated on barge

Alabama State Highway SPECIFICATIONS

QUITE NATURALLY in a State, about one-third of which is a sand and gravel deposit, the most popular highway aggregates in Alabama are sand and gravel, with slag from the steel industry a close second. There are plentiful sources of limestone, dolomite and harder rocks available for aggregates, but they can not compete in price with sand, gravel and slag under ordinary circumstances.

The accompanying chart shows the coarse size gradations (passing the sieve size designated) for all classes of highway construction. The minimum weights per cubic foot are included as a limitation on the slag. The maximum loss limitation of 48 percent (concrete aggregate) and 50 percent (bituminous aggregate) in the Los Angeles rattler test, are unusually high, as measured by the standards of Northern States. The soundness specified—a minimum of 90 percent—is based on the loss of not more than 10 percent in five alternations of the sodium sulphate test.

Subgrade Preparation

Most of Alabama has a fairly heavy rainfall as well as occasional freezing weather. Consequently more attention has been paid to the preparation of pavement subgrades than has been customary in many States. The purpose is to form a stabilized course using "fine gravel, stone or slag screenings, coarse sand, sand-clay, top soil, cinders or other material of granular nature" as the stabilizing media. The stabilizing material is incorporated in the subgrade by plowing and harrowing, and then rolling.

About 8 in. of this compacted granular sub-base is placed over 6 in. of compacted roadbed. The granular sub-base is intended to provide drainage as well as bearing power. On this sub-base are placed all the various types of bituminous pavement, as well as portland cement concrete.

Cement

Normal portland or moderate sulphate resisting portland cements are used except where high early strength portland cement and combinations of slag cement and portland cement are called for on the plans. Slag cement is defined as finely divided hydraulic material consisting essentially of granulated blast furnace slag and hydrated lime, containing at least 60 percent of suitable granulated slag by weight. (Slag cement is an Alabama product.) Portland cement may have up to 5 percent magnesia (MgO). Specific surface of portland cement (A.A.S.H.O., T-98) must not be less than 1600 sq. cm. per gram, and for moderate sulphate resisting portland cement, 1800. The fineness of slag cement must be at least 95

ALABAMA STATE HIGHWAY DEPARTMENT

Date: October 24, 1944.

Special Provision No. 8 Revised (2)

Subject: Chart Showing Size Designation, Use and Gradation of Aggregates

Alabama Standard Specifications, Oct. 1, 1939 issue and Supplemental Specifications issued through Oct. 1, 1944, include certain aggregate gradations which are herewith tabulated and established for general use. In any reference to size designation, the requirements for the sizes listed below shall have precedence. No other gradation shall be covered by these designations. Where other gradations are desired further Special Provisions will be necessary.

AHD Size Designation	USE	Min WT/CF	2-1/2"	2"	1-1/2"	1-1/4"	1"	3/4"	1/2"	3/8"	#4	#8	#10	#16	#40	#200
2	2" Crusher Run (Base)		100	90/100	40/80		25/75		10/50		0/20					
2A	Concrete (Old size 234)(#4 to 2")	75#	100	95/100			35/70		10/30		0/5					
3	1 1/2" Crusher Run (Underdrain Backfill)			100	90/100		50/95		20/60				5/20			
3A	Concrete (Old size 24)(#4 to 1½")	75#		100	95/100		40/90	25/70		10/30	0/5					
3B	Light Penetration-Coarse Aggregate	70#		100	90/100		20/55	0/10								
4	1" Crusher Run				100		90/100		25/70				5/20			
4A	Concrete (Old size 24A)(#4 to 1")	75#			100		90/100		25/60		0/10					
4B	Type 1 Coarse Agg.-SBST or DBST	75#				100	90/100	20/60	0/10		0/2					
5	3/4" Crusher Run						100	90/100		25/60			5/25		0/15	
5A	Concrete (Old size 4C)(#4 to 3/4")	75#					100	90/100		20/55	0/10	0/5				
5B	Type II Coarse Agg.-SBST	75#					100	90/100		0/10	0/2					
5BA	Type B Liquid Seal	75#					100	90/100		0/10	0/2					
6	1/2" Crusher-Run							100	90/100	50/85			5/30		0/15	
6A	Concrete (Old size 5)(#4 to 1/2")	75#						100	90/100		0/15	0/5				
6B	Fine Agg.-DBST-Lt. Pen. Surf.	75#						100	90/100	40/80	0/25		0/6			
6BA	Type A, B, & C Liquid Seal							100	90/100	40/75	0/10		0/2			
6E	Temporary Surface & Stabilizer							100	90/100	70/100	10/60		0/10			
7	3/8" Crusher-Run								100	90/100			15/30		5/40	
7A	Plant Mix-Class "F" Type F-1 Mix A	75#							100	90/100	60/85		35/70		15/35	1/5
7B	Blotting								100	95/100	40/90		0/15	0/5		
7BA	Special Seals								100	75/100	0/25		0/5			
8BA	Special Seals									100	65/90		10/20	0/5		

Los Angeles Test:
Conc. Agg. 48 Max.
Bit. " 50 Max.

Soundness Test:
Conc. Agg. 90 Min.
Bit. " 90 Min.

ALL AGGREGATES SUPPLIED UNDER THESE SIZE DESIGNATIONS SHALL COMPLY WITH ALL OTHER REQUIREMENTS OF THE ABOVE SPECIFICATIONS AND SHALL BE FROM A SOURCE OF SUPPLY CURRENTLY APPROVED BY THE LABORATORY.

percent through 200-mesh. Tensile strengths of 28-day mortar briquettes must be 350 p.s.i. for the portland cements and 250 for slag cement. Corresponding compressive strengths of mortar cubes must be 3000 p.s.i.

Fine Aggregate

Only natural sand is specified as fine aggregate for concrete. It must conform to the following specification as to deleterious substances:

	Percent
Removed by decantation	3.0
Shale	1.0
Coal and/or lignite	1.0
Clay lumps	1.0
Cinders and clinkers	0.5
Other deleterious substances such as alkali, mica, coated grains, soft and flaky particles	2.0
Total shale, coal and/or lignite, clay lumps, cinders and clinkers and other deleterious substances	5.0

The percentage of clay lumps is determined by examining the various fractions which remain after the test for grading. Any particles that can be broken up with the fingers are classified as clay lumps and the total percentage by weight of all clay lumps is determined on the basis of the total original weight of the sample.

In soundness the sample must not lose more than 10 percent by weight in five cycles of the sodium sulphate test, but sand which has proved satisfactory in concrete for at least 5 years is acceptable.

Gradation requirements are:

Total passing	Percentage by weight
⅜-in. sieve	100
4-mesh	95-100
8-mesh	75-100
16-mesh	45- 90
50-mesh	3- 35
100-mesh	0- 3

The accompanying chart shows these gradation limitations as compared with the usual Federal specification.

Fine aggregate from any one source having a fineness modulus variation greater than 0.20 either way *may be* rejected, or may be accepted subject to such changes in the proportions used, as the engineer may direct. The extremes in fineness modulus given in the specification are 2.05 and 3.58—certainly a very liberal range.

Coarse Aggregate

Coarse aggregate for concrete may be gravel, crushed stone, crushed slag, "or other approved inert materials of similar characteristics or combinations thereof." The maximum percentages by weight of deleterious substances are not to exceed:

	Percent
Removed by decantation	1.25
Shale	1.00
Coal and/or lignite	1.00
Clay lumps	0.50
Soft fragments (including free shell)	5.00
Other local deleterious substances (such as mica, alkali, friable pieces)	1.00
Total shale, coal and/or lignite, clay lumps, soft fragments, and other local deleterious substances	5.00

The diameter of deleterious substances shall not exceed the maximum size of aggregate.

The gradation and other properties are shown in the accompanying table.

Concrete

Concrete pavement mixes are based on the necessary weights of fine and coarse aggregate per bag of cement to yield the required cement factor specified for the type mix and gradation of coarse aggregate furnished for the job.

Ready-mixed concrete may be used under the following provisions: "When transit mixing or truck mixing is stipulated in the contract, the transporting vehicles shall be used only after they have received the written approval of the engineer and the method of discharging and spreading the concrete on the subgrade together with other special features will be subject to such approval.

"When concrete mixed at a central mixing plant is stipulated in the contract, the vehicles for the transportation of the concrete shall be equipped with suitable devices for slowly agitating the concrete during transit, and for delivering the concrete in an unsegregated condition and of uniform consistency. The method of discharge and spreading of the concrete on the subgrade together with other special features will be subject to the approval of the engineer."

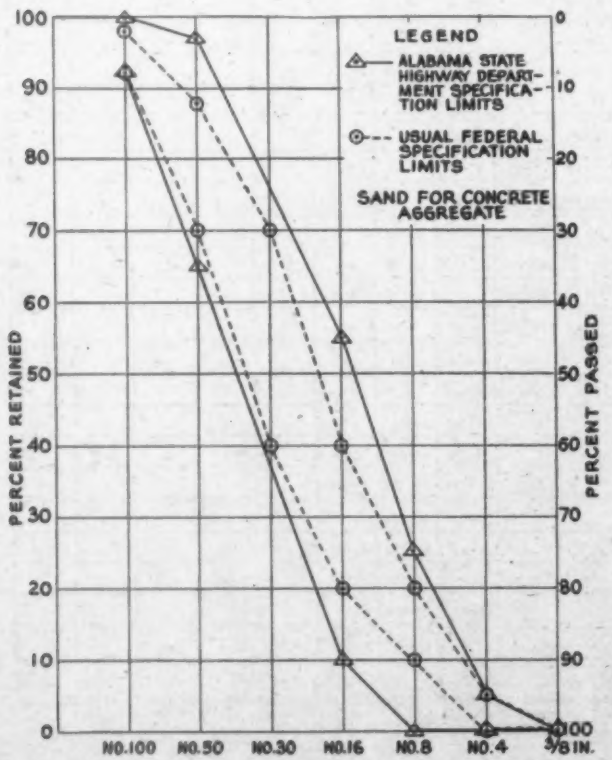
General

It would appear advantageous for the highway contractor in Alabama to stick to commercial aggregates in spite of the fact that there are many local sources of sand and gravel. Section 6 of the specifications, under "control of materials" warns the prospective bidder that: "If it is found that partially developed pits, quarries, ledges, banks, deposits, or other sources of supply that have been previously approved by the engineer do not furnish a uniform product, or if, for any reason, the product from any source at any time proves unacceptable, approved material shall be furnished from other approved sources, and the contractor shall not be entitled to increased compensation on account of such requirement."

Bituminous Pavements

By far the largest percentage of state highways in Alabama is of bituminous construction. In fact the State Highway Department had no specifications for cement concrete

(Continued on page 86)



Curve of sand gradations for concrete, Alabama State Highway Department

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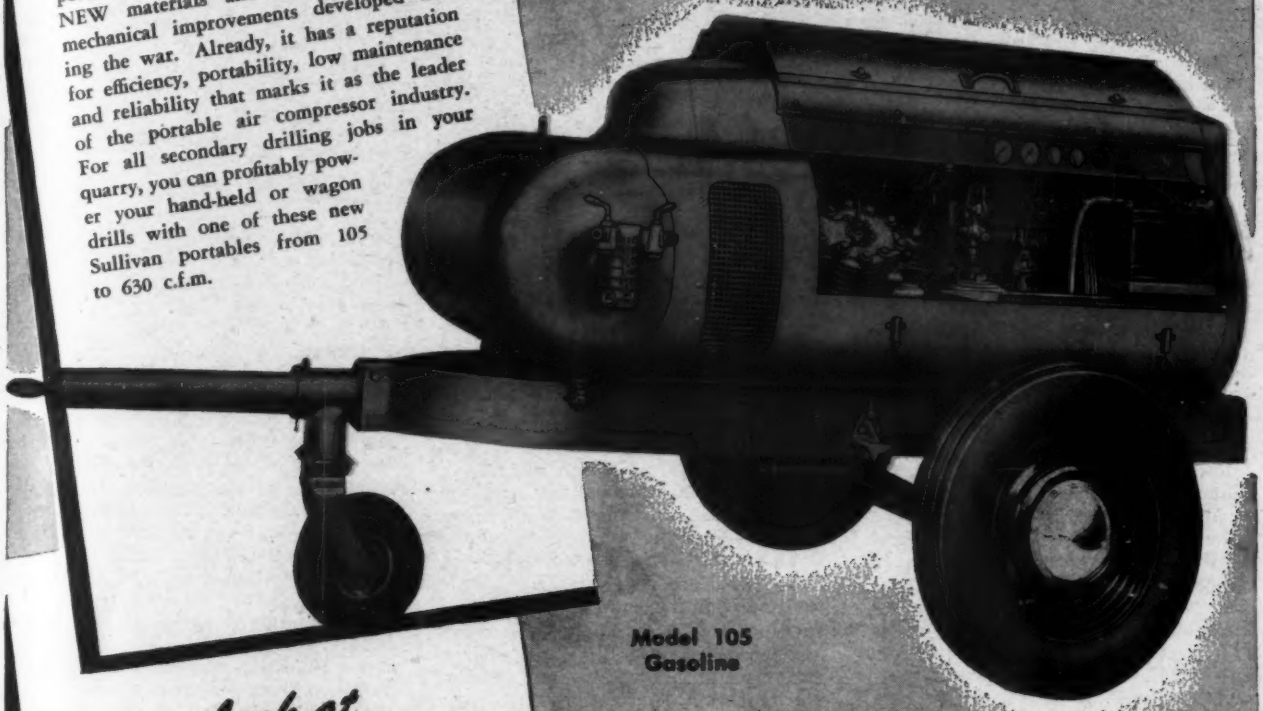

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SULLIVAN

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pavement until 1939. In this post-war period the State has some $58,000,000 to spend, and only about 20 percent of the new highways will be concrete.

Two classes of asphalt or tar construction are used: (1) Inverted penetration types No. 1 and No. 2; plant mix—cold. Types 1 and 2 of the inverted penetration class differ only in the amount of aggregate per square yard (0.48 cu. ft. in Type 1 and 0.42 in Type 2).

The aggregate may be gravel, crushed slag, crushed stone, but it must be of such character "that when once thoroughly coated with the bituminous material proposed for the work, the coating will not slough off upon contact with water."

Only one type of aggregate may be used on the same job, except by permission of the engineer.

The gradation must be within the following limitations:

Total Passing (Square Mesh)	Percentage by Weight Type 1 Percent	Type 2 Percent
1¼-in.	100	
1-in.	95 to 100	100
¾-in.	20 to 60	80 to 100
½-in.	0 to 10	
⅜-in.		0 to 10
No. 4	0 to 2	0 to 3

Aggregate for the cold-mixed seal or wearing course must conform to the following gradation:

Passing (Square Mesh)	Percentage by Weight Percent
½-in.	100
⅜-in.	85 to 100
No. 4	40 to 90
No. 10	20 to 70
No. 40	5 to 35
No. 200	0 to 10

PLANT PRACTICES

FIVE of the six portland cement plants in Alabama are located in or around the Birmingham area, where all the needed materials for the production of cement occur within a few miles of one another. Nearby coal fields offer another economy since they are close enough to make transportation of fuel to the plant very cheap.

National Cement Co., at Ragland, quarries the Little Oak limestone of Ordovician age and Floyd shale of Mississippian age. The two formations are adjacent to one another so that the same conveyor system moves both ingredients from the quarry to the plant. This is the only plant which features a long belt conveyor method of movement, having a conveyor system about 1¼ miles long with seven transfer stations. The conveyors have interlocking motor controls so that should one stop, the conveyors behind it also are stopped, thus preventing stone from piling up at the point of stoppage. An article on the belt conveyor installation appeared in the September, 1943, issue of ROCK PRODUCTS, p. 58.

This plant employs the dry process, and the product is known as Coosa brand. There are five kilns of 7½-, 8- and 9- x 125-ft. and the capacity of the plant is about 1,750,000 bbls. of finished cement annually.

Universal Atlas Cement Co. has a plant at Leeds, just east of Birmingham, which was completely rebuilt in 1938, in converting from the dry to wet process and for greater capacity. An article on this plant appeared in ROCK PRODUCTS in March and April, 1939. Raw materials used are the Lenoir, Mosheim, and Newala limestones of Ordovician age, Floyd shale, Shades sandstone member of the Pottsville formation, and a small proportion of iron ore.

Other changes made here were mechanization of the limestone quarry and electric haulage system. There are two kilns, 10 x 300 ft.

Located at Tarrant City, near the heart of Birmingham, is the plant of the Lehigh Portland Cement Co. Raw materials are Conosauga limestone, of Cambrian age, quarried just south of the plant, and clay and sand. Fuel is coal, and the plant operates on the wet process.

The Birmingham plant of the Lone Star Cement Corp. is also located at Tarrant City. Local Conosauga limestone and shale are used. The plant operates on the dry process and has a capacity of about 1,800,000 bbl. annually.

Alpha Portland Cement Co., at Phoenixville, just south of Birmingham, uses local Conosauga limestone, sandstone of the Pottsville formation and Cretaceous soft sand from Reno, Ala. These ingredients, together with Birmingham iron ore, furnish the siliceous and ferruginous materials for the raw mix. The wet process is employed and the clinker is burned with coal.

Lone Star Cement Corp. also operates a plant at Spocari, near the Mississippi line, where the raw materials are Selma chalk (or argillaceous limestone) of Cretaceous age, obtained from extensive open pits at the plant, and fine sand from the bank of the Warrior River. The chalk is soft enough to be cut with a pocket knife and is cut, or shaved, from vertical faces by knives carried on an elevator-conveyor in such a way that the shavings of chalk fall into the buckets following below. This machine is known as an Adel excavator and can be operated by two or three men. It stands on the tracks on the

(Continued on page 110)

Views of John S. Lagarde plant at Anniston, Ala., to the left, fines reclaimed in classifier are dewatered in screws; to the right, water is reclaimed in classifier for reuse.

GROUND GRIP

WHEN other tires quit — gum-up and spin — the Firestone Ground Grip keeps driving — maintains maximum traction in loose fill or over unimproved haul roads. Specifically designed for the drive wheels of earth-moving trucks and equipment, this special purpose tire has proved itself to be the greatest traction tire ever developed for off-the-highway work. The connected triple-braced tread bars pack down loose earth as they dig into the ground. Flexing action of the continuous tread design forces dirt from between the tread bars — keeps them clean, ready for the next traction bite.

Firestone Ground Grips on the drive wheels of your off-the-highway equipment out-pull any other tire ever built, cut your operating time — and costs — to the minimum.

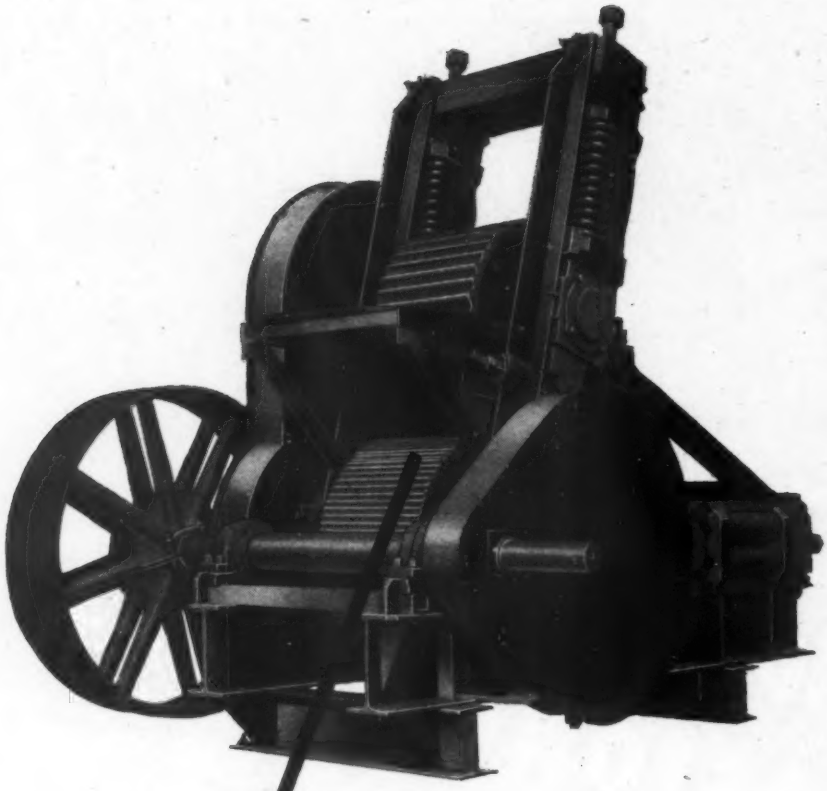
For the best in music, listen to the "Voice of Firestone" every Monday evening over NBC network.

ALL NON-SKID
Designed to give maximum flotation to free-rolling wheels on drawn earth-moving scrapers, wagons and buggies.

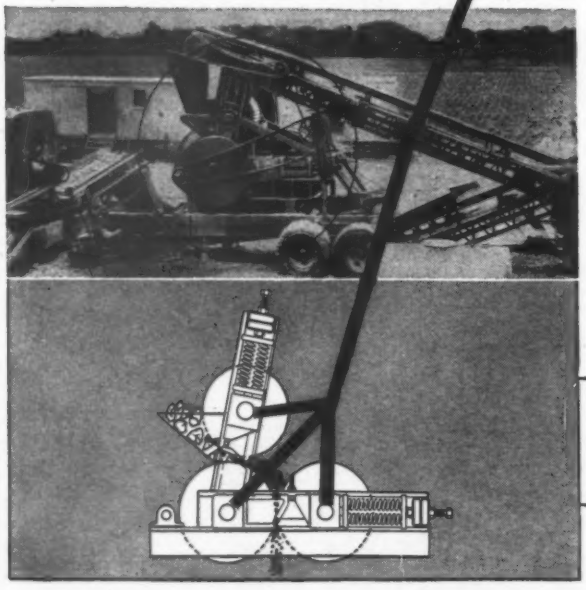
ROCK GRIP EXCAVATOR
Delivers extra traction plus stamina in toughest trucking operations, quarrying, logging, construction work, ore and coal strip mining.

Copyright, 1946, The Firestone Tire & Rubber Co.

Firestone OFF-THE-HIGHWAY TIRES



Revolutionary 2 in 1 Action...



THERE'S NOT an idle square inch on a roll crusher shell. With 100% of the shell surface a working surface, roll crushers have a larger capacity for fine materials than any other type of crusher.

Now, with the addition of a third roll, PIONEER combines the functions of 2 crushers in 1, greatly *increasing the stage of reduction.* The Triple Roll Crusher saves on original cost, operating expense, weight, space, and extra elevators and conveyors.

The two bottom rolls are 40" x 22" and the top roll is 34" x 22". The third roll assembly can be shipped complete with all attachments to those having a PIONEER 40" x 22" double roll crusher.

We'll be glad to give you full details on this new PIONEER Crusher with revolutionary 2 in 1 action.

"It's the best secondary crusher made," says Norman Roverud of Spring Grove, Minnesota. ***Revolutionary 2 in 1 action.*** Material first passes between the floating top roll and the driving roll. Then, without elevators or conveyors, it passes between the driving roll and horizontal floating roll.

PIONEER ENGINEERING WORKS, INC.
1515 CENTRAL AVE. • MINNEAPOLIS 13, MINNESOTA

Engineers and Manufacturers of Quarry—Gravel and Mining Machinery

PLAN WITH

Pioneer

ENGINEERING WORKS

H. W. Holt & Son's Tournapulls stripped shallow overburden from American Aggregates Company's Columbus, Ohio gravel property.

SHALLOW OVERBURDEN stripped with TOURNAPULLS

H. W. Holt & Son chose Tournapulls for their stripping contract on the American Aggregates Company pit in Columbus, Ohio. Job runs over 180,000 yards and involves removing gravelly top soil 1 foot to 18 inches deep.

60,000 yards in 300 hours . . .

In the first 300 hours of operation, on hauls varying from 1500 to 2600 feet one way, job records show that the two Tournapulls have moved a total of 60,000 yards. That's an overall average of 100 yards an hour for each Scraper unit. The rigs spread stripped material along pit banks to landscape for a future lake on the site.

Fits job requirements . . .

Holt found their Tournapulls particularly well adapted to this job because: (1) They strip heaped loads just as efficiently along a few inches of overburden as they do on deeper banks, (2) maintain production on both long and short hauls, (3) combine and simplify load-haul-and-spread operations for minimum investment, with less manpower. (4) Job flexibility enables them to strip any section of the pit at any time and spread their loads evenly to landscape requirements.

Self-powered moves — another benefit . . .

Holt drove their Tournapulls 405 miles to the job in 28 hours driving time . . . will find this mobility a time and money-saver over normal equipment shipping delays between future jobs.

Put these savings to work for you . . .

These are just a few of the reasons why leading stripping contractors are turning to Tournapulls for lowest-net-cost-per-yard. It will pay you to ask your LeTourneau Distributor to check your stripping costs against modern Tournapull economy. See him TODAY.

FQM

▲ En route to the job, Holt's big-tired Tournapulls made the 405-mile trip in 28 hours' driving time.

Tournapulls fit any type of dump problem . . . spreading for landscaping like this, disposal in mined out pit, piling on bank or in waste areas.

▼

LETOURNEAU

PEORIA, ILLINOIS — STOCKTON, CALIFORNIA

JOB-PROVED Over 4300 Built and Shipped

TOURNAPULLS

LIKE A CHAMPION FENCER

FORM-SET ROPE IS *Relaxed*

Study the fencer's movements. Watch him in action. He's graceful, agile, light on his feet. Muscles flow freely. There's nothing about him suggestive of tension. He's learned to *relax* while engaged in a contest of skill and endurance.

In Bethlehem's Form-Set rope, you'll find much of that same relaxed effect—a quality that pays heavy dividends.

Every wire and strand of Form-Set rope is preformed into a permanent helical shape before being laid in the rope. This means that the inner tension has been eliminated. The wires and strands have no tendency to "fight themselves" or each other.

You can prove this simply by cutting a section of Form-Set, leaving it unseized. Each and every wire lies just as it was. No bushing—no flying apart—for the wires and strands are *relaxed*.

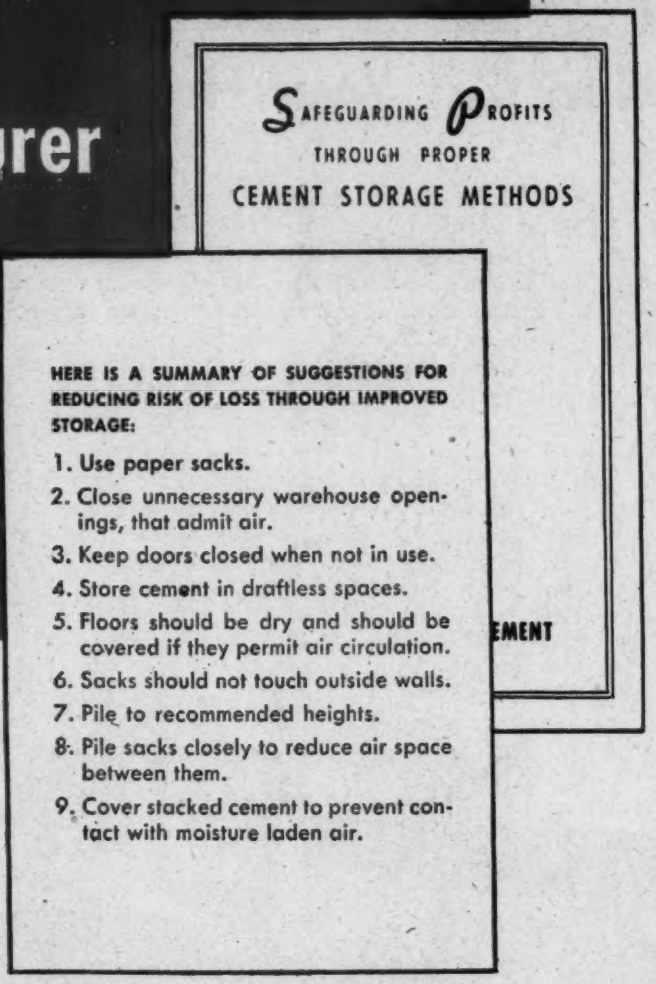
What does this mean? For one thing, easier handling. More important, though, is the longer life that often results when the rope is subjected to sharp turns and bends—reverse bends, for instance.

All grades, sizes, and types of Bethlehem wire rope can be obtained with the Form-Set construction. Ask the nearest Bethlehem office or distributor to tell you more about it.

Here is a piece of "relaxed" wire rope. Even when cut or broken, the Form-Set wires and strands lie calmly in place. No tension at all—yet the toughness remains.

When you think WIRE ROPE . . . think BETHLEHEM

A leading cement manufacturer tells how paper bags are safeguarding profits


SAFEGUARDING PROFITS
THROUGH PROPER
CEMENT STORAGE METHODS
HERE IS A SUMMARY OF SUGGESTIONS FOR REDUCING RISK OF LOSS THROUGH IMPROVED STORAGE:
1. Use paper sacks.
2. Close unnecessary warehouse openings, that admit air.
3. Keep doors closed when not in use.
4. Store cement in draftless spaces.
5. Floors should be dry and should be covered if they permit air circulation.
6. Sacks should not touch outside walls.
7. Pile to recommended heights.
8. Pile sacks closely to reduce air space between them.
9. Cover stacked cement to prevent contact with moisture laden air.

In a recently published booklet, "Safeguarding Profits through proper Cement Storage Methods" a leading cement manufacturer lists the use of paper bags *first* in a list of suggestions for reducing risk of loss during storage. This booklet, which describes the everyday, but important, precautions to be taken in the storage of cement, says:

> **"Because paper sacks have several layers or walls that help to repel moisture, many users have learned through experience that better protection is afforded in the paper package."**

For years users of cement have found that the multiple plies of kraft paper that go into the construction of Multiwall Paper Bags give maximum protection against the worst enemy of stored cement . . . MOISTURE. For protection of cement while in transit or when stored . . . use Multiwall Paper Bags.

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

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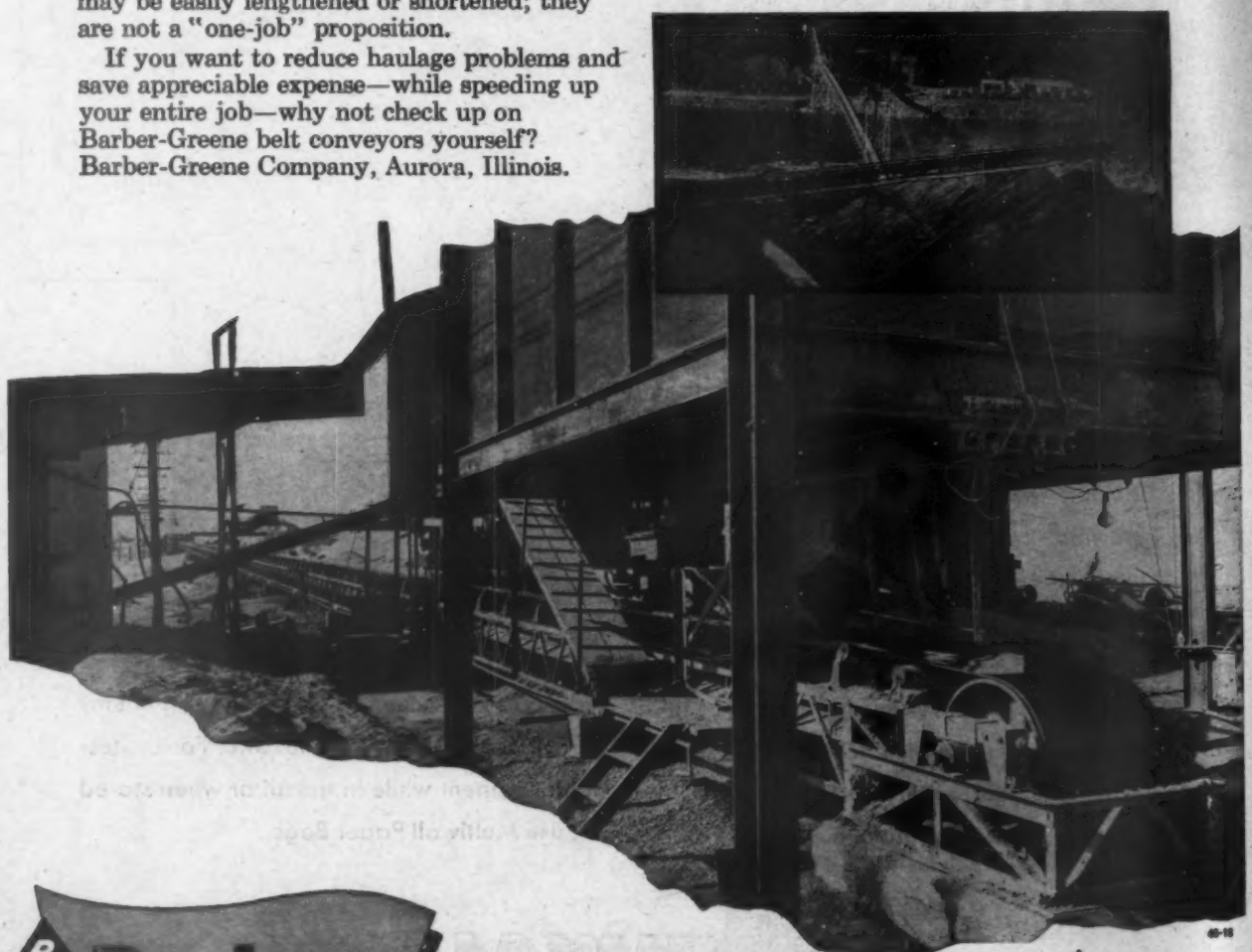
How B-G Belt Conveyors Can Cut Your Hauling Costs!

• If you've bulk materials to haul between your job and stock pile, railroad siding or mixing plant, don't overlook B-G belt conveyors.

These pre-engineered belt conveyors are widely preferred for short hauls uphill and down, across gullies, tracks, rivers and other obstructions. Wherever used, they carry a constant flow of materials at a cost per yard so low that other methods seldom can compete with them successfully.

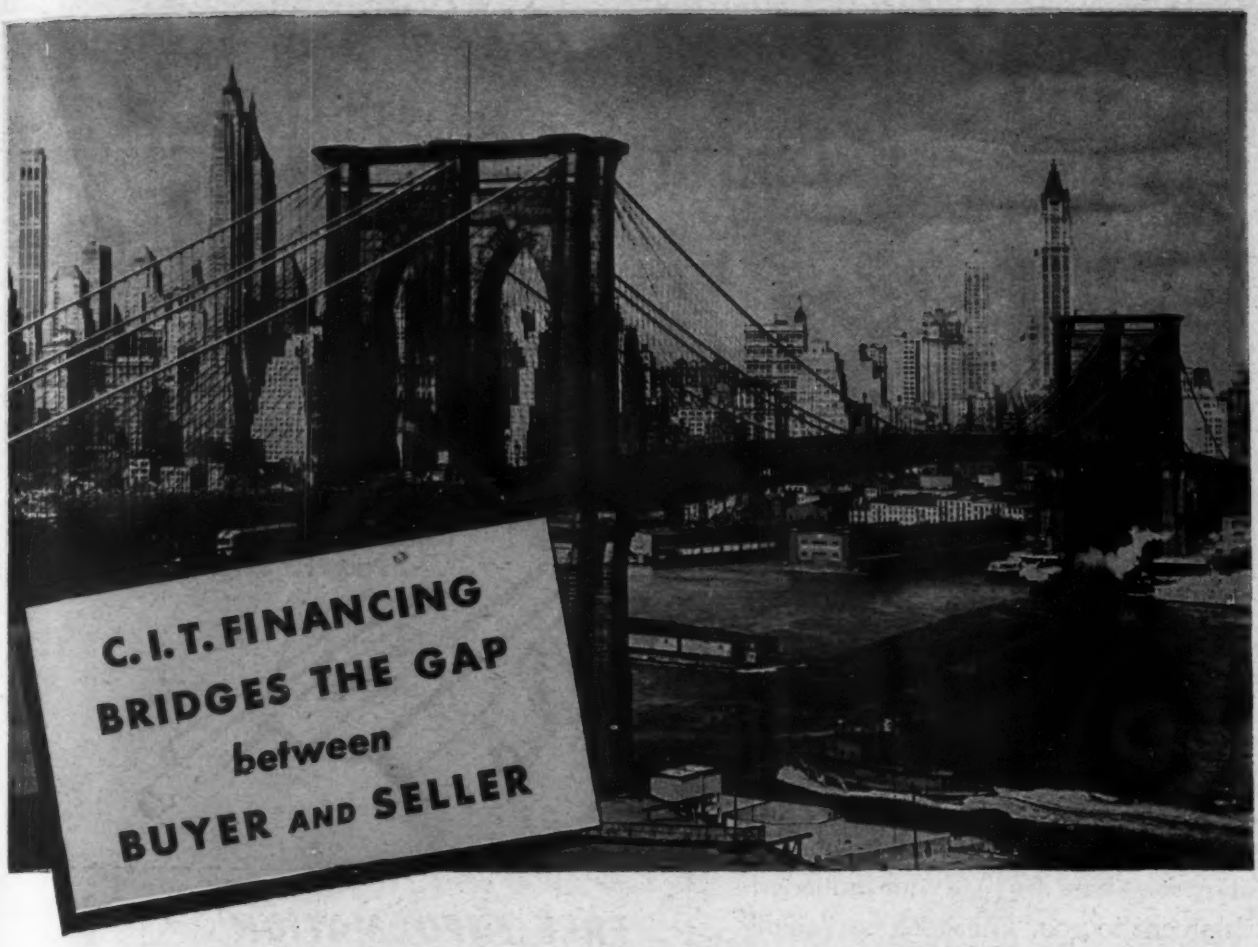
Barber-Greene belt conveyors are prefabricated, "packaged" units—simply built, easily erected. They often pay for themselves by eliminating the cost of rail or roadbed preparation. And they may be easily lengthened or shortened; they are not a "one-job" proposition.

If you want to reduce haulage problems and save appreciable expense—while speeding up your entire job—why not check up on Barber-Greene belt conveyors yourself? Barber-Greene Company, Aurora, Illinois.



B-G Barber-Greene CONSTANT FLOW EQUIPMENT

LOADERS • PERMANENT CONVEYORS • DITCHERS • PORTABLE CONVEYORS • FINISHERS • BITUMINOUS PLANTS • COAL MACHINES



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There's no need to tie up working capital when you purchase additional equipment. Conserve your funds for payrolls, supplies, general operating uses. LET C.I.T. FURNISH THE MONEY to buy income producing machinery.

C.I.T. WILL FINANCE THE PURCHASE of construction equipment AT LOW COST. Any amount, any time, for immediate use or future deliveries.

More than one piece of equipment can be financed . . . combine several purchases of new, used or surplus machinery in one obligation. Retire the investment over extended periods through monthly amortization payments.

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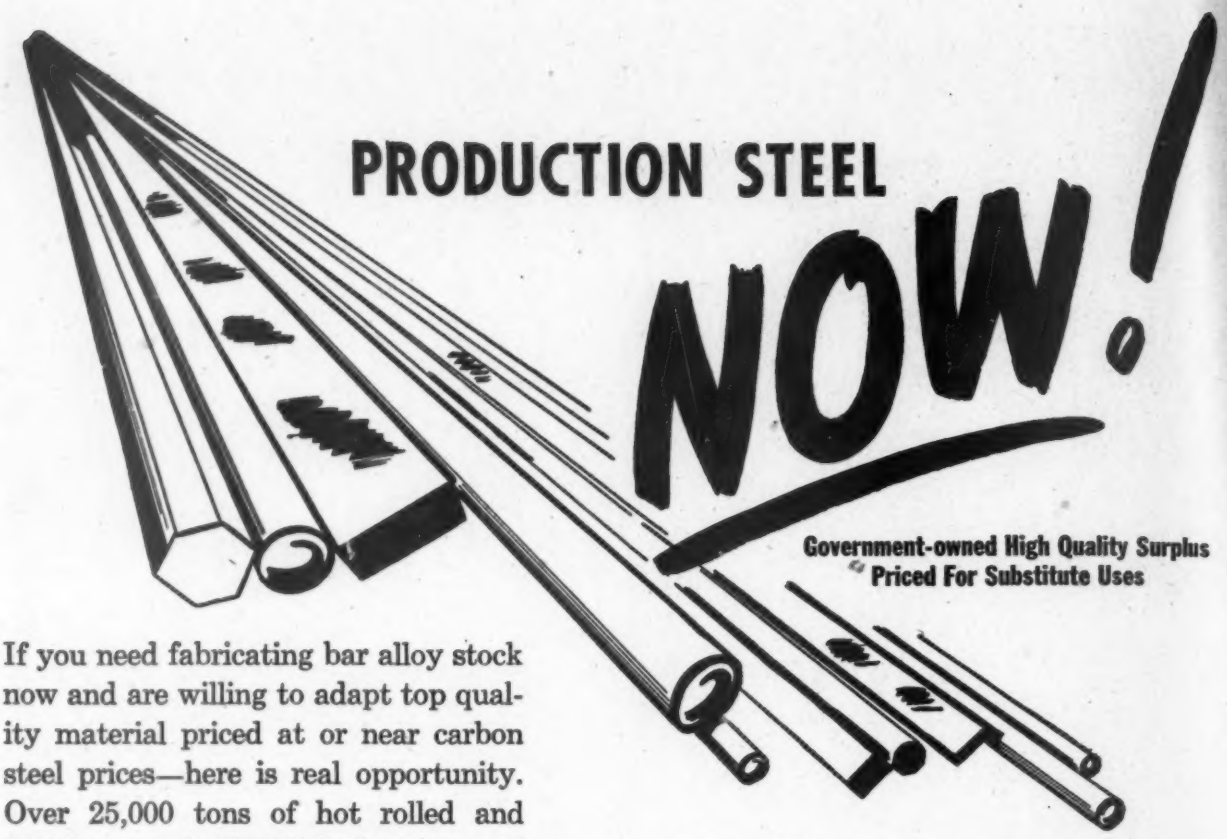
AFFILIATED WITH COMMERCIAL INVESTMENT TRUST INCORPORATED



PRODUCTION STEEL NOW!

Government-owned High Quality Surplus Priced For Substitute Uses

If you need fabricating bar alloy stock now and are willing to adapt top quality material priced at or near carbon steel prices—here is real opportunity. Over 25,000 tons of hot rolled and 25,000 tons of cold finished carbon and alloy steel bars are ready for immediate shipment to you. The stock is available in standard sizes, shapes, but is of above average grades. Accordingly it has been priced at levels such as to insure its quick employment to meet America's postwar needs. For details on F.O.B. locations, sizes, quantities and shipping arrangements contact your nearest W. A. A. Regional Office below . . . or clip and mail this coupon.

VETERANS OF WORLD WAR II: To help you in purchasing surplus property from W. A. A. a veterans' unit has been established in each of our Regional Offices.

FREE INFORMATION

To War Assets Administration:

Please send me information on the availability and pricing of the following:

Carbon and Alloy Billets, Blooms, Slabs, Rods, etc..... ☐
H. R. & C. F. Alloy Sheets, Strips and Plates..... ☐
Stainless Steel Sheets, Strips, Standard Types..... ☐
Valves and Fittings..... ☐
Mechanical Tubing, Carbon and Alloy..... ☐

NAME.....TEL. NO.....

FIRM.....

ADDRESS.....

CITY.....STATE.....

157-5

WAR ASSETS ADMINISTRATION

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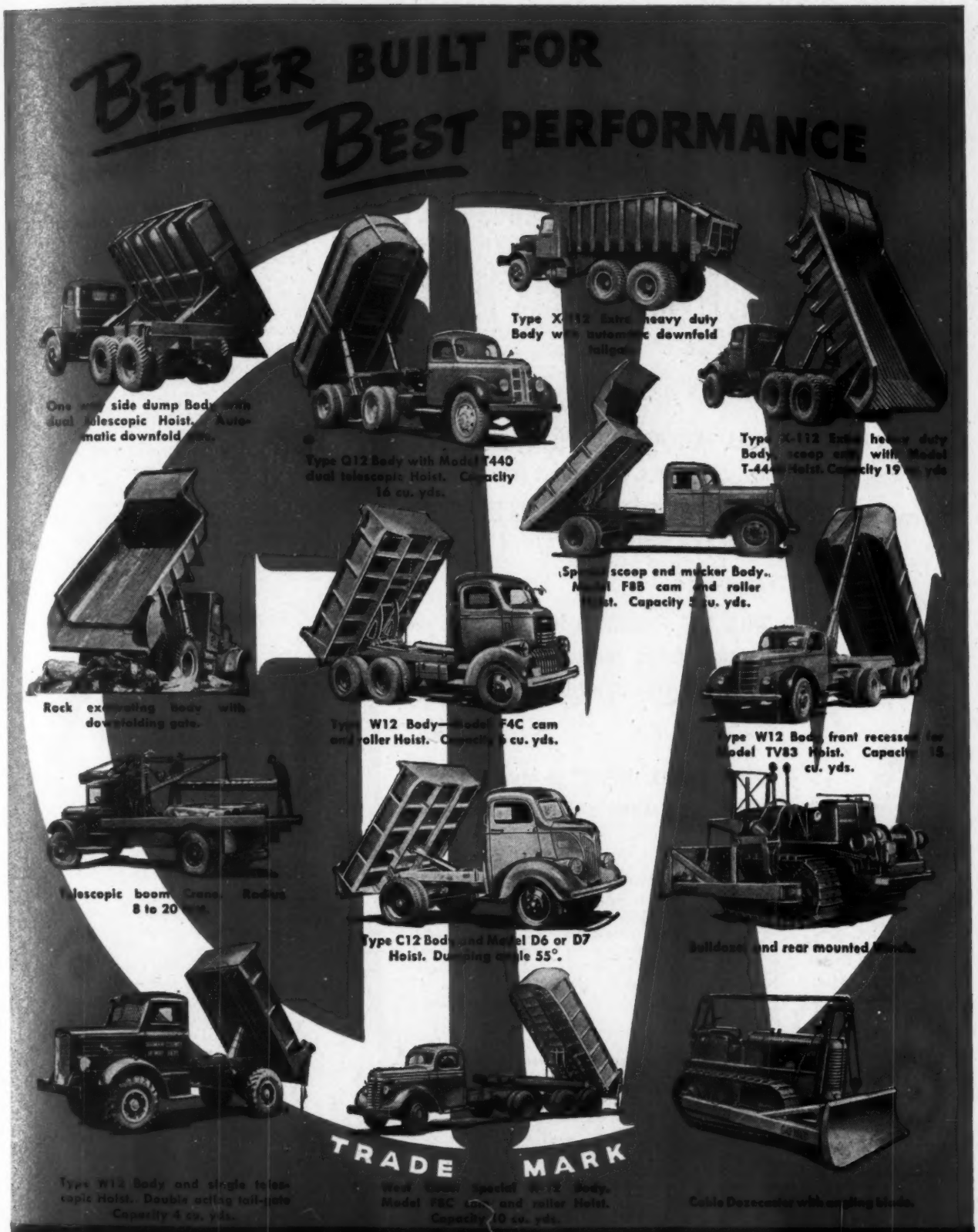
BETTER BUILT FOR BEST PERFORMANCE



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GAR WOOD INDUSTRIES, INC.

7924 RIOPELLE ST. • DETROIT 11, MICH.

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

OTHER PRODUCTS: TANKS • HEATING EQUIPMENT • MOTOR BOATS

Nitro Starch Base

HIGH EXPLOSIVE EFFICIENCY

IN MINING · QUARRYING · LOGGING · CONSTRUCTION

Plus THREE ADVANTAGES FOR YOU!

1 WILL NOT PRODUCE HEADACHES from handling . . . reduces discomfort from breathing muck pile fumes. Better working conditions for you and your men!

2 WILL NOT FREEZE or leak at Arctic or Tropic temperatures. Maintained high efficiency . . . anywhere . . . anytime!

3 WITHSTANDS IMPACT in high-powered Rifle Bullet Test. Greater safety for workers!

• These three Trojan advantages mean greater safety and comfort for your workers—increased efficiency during and after all blasting operations. Known throughout the Country as outstandingly reliable products, uniformly effective in all kinds of climate, Trojan Explosives can be relied upon to 'do a job'—and do it well!

EXPLOSIVES 1905 TROJAN 1945 CHEMICALS

TROJAN POWDER COMPANY

One of America's Oldest High Explosives Manufacturers

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One-Man Control

(Continued from page 65)

storage. Due to the critical war shortage of steel, the Union Rock and Materials Co. had to make the bents and the bin structure of wood. However, the balance of the plant is of modern concrete and steel construction.

Plant design was worked out by Stephens - Adamson Manufacturing Co., in cooperation with R. Glen Jones, plant superintendent. All of the conveyor troughing rolls are S-A Pacific Timken roller bearing type. Drives are roller chain to Saco reducers with Texrope drive to splash-proof ball bearing motors mounted on bases on top of the reducers. All drives are standardized as near as possible for simplicity of maintenance. The three Stephens-Adamson vibrating screens are exactly the same so far as the driving mechanism is concerned and for the same reason. S-A Sealmaster ball bearings are used throughout the plant. Other Stephens - Adamson equipment includes the reciprocating plate feeder, quadrant bin gates, and all belt conveyors.

Chemist Corner

(Continued from page 69)

order to make the unit more useful, it would be desirable to have it completely automatic. Therefore, arrangement was made to mount a synchronous motor on the scanning arm, so that the latter would be automatically traversed. This permitted the use of a synchronous motored strip-chart recorder, and for this purpose, the Brown ElectroniK Potentiometer Recorder was employed. This has been specially adapted for use with the North American Philips spectrometer, and is provided with special charts. These facilitate measurement of peak angular displacements which correspond with beam separations, as well as the heights of peaks which give intensities. The Norelco Spectrometer and the Brown ElectroniK Recorder are illustrated in Fig. 5. The result of this cooperative engineering has been a happy union of instruments which has been well justified by the results.

Masonry Specifications

NEW YORK State Department of Public Works in its specifications for the use of concrete masonry units to be used in public buildings includes a provision for alternate types of curing as follows:

"Concrete masonry units may be either high pressure steam cured at a pressure of not less than 120 lb. per sq. in. or more than 150 lb. per sq. in. for at least 8 hours; or high temperature steam cured at a minimum temperature of 180 deg. F. for at least 12 hours."

FIRST *in Mining*

TIGER BRAND takes stripping in its stride!

. . . it's tougher than the job!

MADE of high tensile wire from select U·S·S Steel, TIGER BRAND is extra tough, extra flexible. Whether you're stripping or operating underground, it will help you reduce maintenance and replacement costs.

In Excellay Preformed construction TIGER BRAND is easy to handle . . . can be installed quickly . . . has less tendency to loop and kink . . . has higher resistance to bending fatigue, features which insure longer life and improved performance. It is safer, too. Crown wires lie flat and in position when broken and do not stick out to injure handlers.

You can't buy finer wire rope at any price, so get in touch with your nearest supplier today.

Excellay Preformed

AMERICAN STEEL & WIRE COMPANY
Cleveland · Chicago · New York

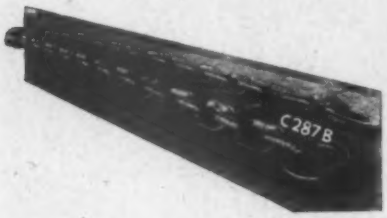
COLUMBIA STEEL COMPANY, *San Francisco*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York

UNITED STATES STEEL

U·S·S AMERICAN
TIGER BRAND *Wire Rope*

A Dragline Bucket is *as Good as the Metal in It*

Certain parts of dragline buckets must withstand continuous service abuse; in many cases what might be termed "cruel and unusual punishment."



C287B — Manganese steel dragline bucket pulling chains (U. S. Patent 2,103,972).

As the application of dragline buckets broadened — embracing stripping and working in such materials as hard shale, cemented gravel, conglomerate, hard pan and blasted rock—stronger and more durable buckets became a necessity. This problem has been met not only by improved design, but by the advantageous use of "the toughest steel known."

S50 — Complete manganese steel sheave blocks.

The wearing parts of a dragline bucket — such as the lip, teeth, chain, bucket and harness fittings, sheaves and blocks — must withstand heavy shocks and stresses and grinding abrasion. For these parts, tough, wear-resistant austenitic manganese steel has demonstrated an unequalled durability.

Long life with a minimum of time out for repairs, is built into dragline buckets equipped with Amsco manganese steel parts to withstand this destructive abuse. Several typical applications are shown in the pictures.

Similar savings in maintenance costs and lost productive time are effected by the use in the dragline machine itself of such manganese steel parts as crawler pads, sprockets, idlers and rollers.

R720—Manganese steel lip for 20-yard dragline bucket.

Amsco manganese steel castings as made for leading builders of draglines and shovels are described in Bulletin 641-S.

(Amsco Manganese Steel Castings are produced and sold in Canada by Joliette Steel Ltd., Joliette, Quebec.)

AMSCO

Foundries at
Chicago Heights, Ill.; New Castle, Del.;
Denver, Colo.; Oakland, Calif.;
Los Angeles, Calif.; St. Louis, Mo.
Offices in Principal Cities

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS • ILLINOIS

American Brake Shoe Company

Canadian Mining Institute Meetings

(Continued from page 75)

it would withstand temperatures up to 700 deg. C. as compared to 500 deg. C. It was melted at 1200 deg. C. and alumina brick used in the furnaces had a life of 4 to 8 weeks. Wool was observed reinforced with wire for packing around doors in place of gaskets and made into 1- or 2-in. ropes for winding around pipes.

Cement Manufacturing Practices

Cement manufacturing methods were found inferior to those in America. Most of the production is by dry process. Lepol kilns, in considerable use, were found to have excellent thermal efficiency. The plants were clean and dust-free almost without exception and there was no evidence of wastage. Power consumption ranged from 80 k.w. to 94 k.w. per ton of cement produced and 2.5 was the average man-hours per ton. A great number of dust filters were in use but hand labor was prevalent in quarries. There were no bulldozers and no big blast-hole drills. In fact, solid steel shank drills with spirals to bring up cuttings were still in use.

Mr. Goudge heard rumors of a process, which he could not substantiate, by which white cement was supposed to have been manufactured without the need for low-iron raw materials. The process was supposed to consist of addition of two percent borax to the mix, fusion in the kiln in a reducing atmosphere and then quenching in water. Followup of this rumor to the manufacturer who was in jail as a Nazi, developed that the only secret to the process was quenching of the fused product in water, and that low-iron raw materials were employed.

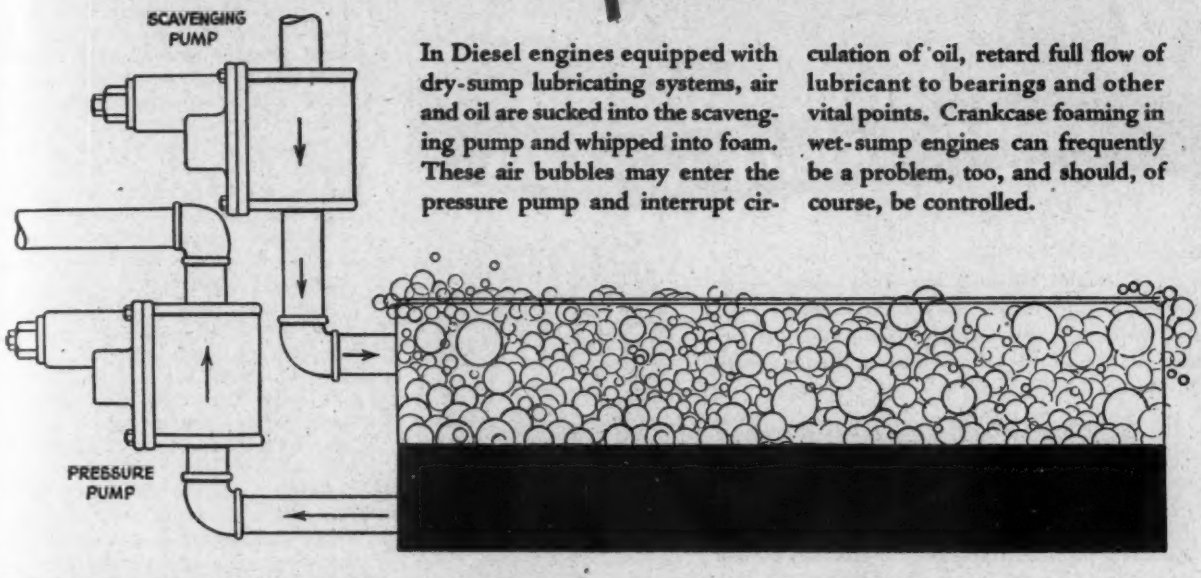
At a plant in the Sudetanland, alumina for alloys was manufactured from clay and high calcium limestone, fired by coal at a temperature of 1400 deg. C. in a reducing atmosphere. Cement was manufactured as a by-product from the dicalcium silicate.

Germany had no domestic mica and, during the last year of the war, had developed synthetic phlogopite mica of very satisfactory grade on a semi-commercial scale. Attempts to produce muscovite mica, however, were unsuccessful. Two separate organizations, Siemens and Schuckert, and Kaiser Wilhelm Institute for Silicate Research, both of Berlin, were designated to develop synthetic mica. The latter concern did not progress beyond the laboratory stage but Siemens and Schuckert was producing 60 kg. per month of a synthetic mica actually superior to the natural mineral. Cost of manufacture was ten times the cost of the natural product but, on a larger production rate, probably could have been reduced to three times as much.

(Continued on page 100)

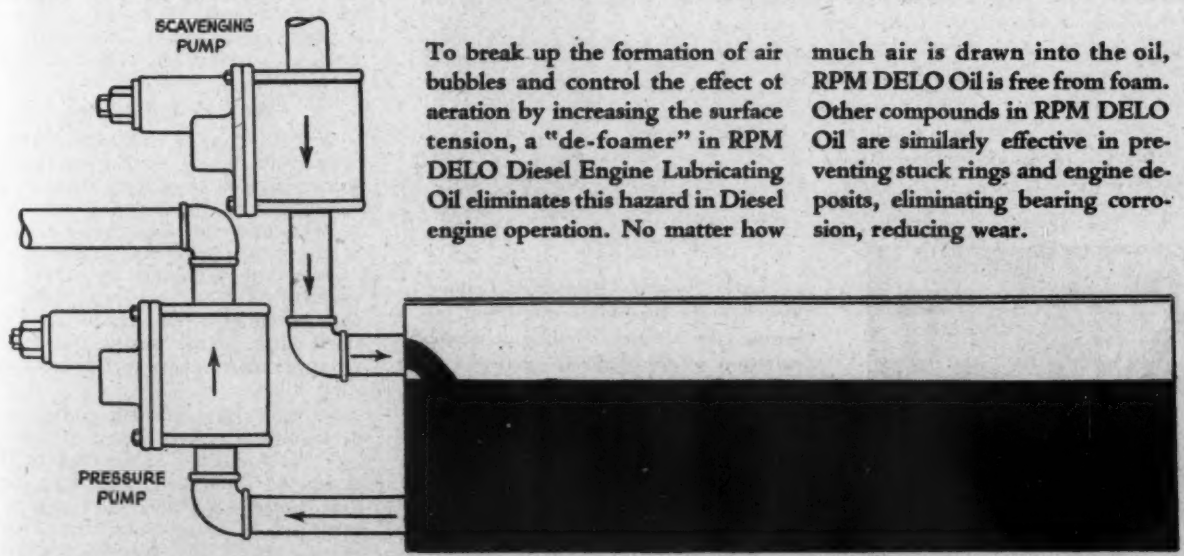
Diesel Engine DANGER points

AIR BUBBLES ENDANGER OIL CIRCULATION



In Diesel engines equipped with dry-sump lubricating systems, air and oil are sucked into the scavenging pump and whipped into foam. These air bubbles may enter the pressure pump and interrupt circulation of oil, retard full flow of lubricant to bearings and other vital points. Crankcase foaming in wet-sump engines can frequently be a problem, too, and should, of course, be controlled.

RPM DELO OIL PREVENTS CRANKCASE FOAMING



To break up the formation of air bubbles and control the effect of aeration by increasing the surface tension, a "de-foamer" in RPM DELO Diesel Engine Lubricating Oil eliminates this hazard in Diesel engine operation. No matter how much air is drawn into the oil, RPM DELO Oil is free from foam. Other compounds in RPM DELO Oil are similarly effective in preventing stuck rings and engine deposits, eliminating bearing corrosion, reducing wear.

To match the fine performance of RPM DELO OIL, use these equally efficient companion products from the same famous "RPM" line—RPM HEAVY DUTY MOTOR OIL—RPM COMPOUNDED MOTOR OIL—RPM GEAR OILS AND LUBRICANTS—RPM GREASES. For additional information or name of your distributor, write any of the companies below:

STANDARD OF CALIFORNIA · 225 Bush St., San Francisco 20, California
THE CALIFORNIA COMPANY · 17th and Stout Streets, Denver 1, Colorado
STANDARD OIL COMPANY OF TEXAS · El Paso, Texas
THE CALIFORNIA OIL COMPANY · 30 Rockefeller Plaza, New York 20

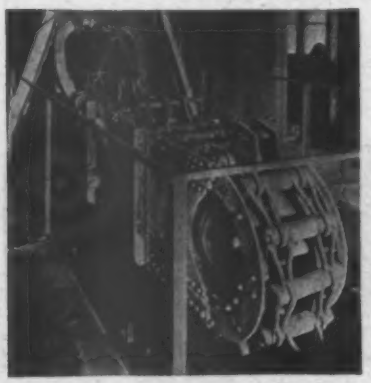
RPM DELO
DIESEL ENGINE LUBRICATING OIL

Another "Swintek" for Slider

Since 1930 E. T. Slider, Inc. has operated the 15" – 75' Eagle "Swintek" Dredging Ladder shown below on its Dredge No. 4. During these 15 years the "Swintek" has rendered profitable service under all conditions of Ohio River dredging. Mr. Slider wrote:

"The 'Swintek' increased our production about 30%, and is giving us continuous operation and an even flow of material at all times. We are passing about 700 tons per hour through our 15" pipe line. Fuel consumption is very low. Formerly we had difficulties due to boulders and penetrating hard pan. Now we find it an easy matter to go through 24" to 30" of hard pan, and the 'Swintek' takes out all boulders and other refuse."

Recently, when Slider Dredge No. 5 was modernized the Eagle "Swintek" Dredging Ladder pictured at the right was ordered. This unit, of the same size as the previous one, is equipped with side braces for additional strength against the "swells" of the Ohio, and to make possible traversing the ladder during dredging for more thorough cleaning up of deposits.



Eagle "Swintek" Dredging Ladders assure more profitable operation, allowing for deeper dredging, proper agitation of the deposit, exclusion of boulders and debris from the pipe line, and increased output of higher quality material.

Write for new catalog No. 745, which contains full information.

EAGLE IRON WORKS
133 Holcomb Ave.
Des Moines, Iowa

EAGLE *Specialized Sand and Gravel Equipment*
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS
CLASSIFIERS — REVOLVING SCREENS
EAGLE IRON WORKS
DES MOINES, IOWA
"SERVING INDUSTRY FOR OVER SEVENTY YEARS"

Canadian Mining

(Continued from page 98)

Other synthetic minerals manufactured or in the process were quartz crystals, nepheline and asbestos. Quartz crystals were made from aqueous solutions in electrically controlled apparatus. Crystals up to 1½-in. size were grown on seeds of $NaBrO_3$ in 16 days. The Germans were unsuccessful in making synthetic crysotile asbestos but did produce amphibole fibre asbestos. Precipitated silica and fluorides of calcium, magnesium and ammonium were the raw materials. They were introduced in powdered form on trays into gas furnaces and heated to 400 deg. F. A current of heated air carrying water vapor and fluoride vapors was passed through under slight pressure, the vapors acting as mineralizers to cause the formation of fibres.

Anhydrite was used to manufacture H_2SO_4 and ammonium sulfide, clay being ground with the anhydrite and heated to 2450 deg. F. in a rotary kiln with 4 percent coke (reducer), firing being such as not to burn out the coke. About 8 to 9 percent SO_2 was obtained and H_2SO_4 was made through a contact acid plant. Cement was a by-product.

Mr. Goudge concluded his talk with a presentation of slides showing some of the plants and quarries and by answering questions from the floor. It developed in the discussion that considerable cement is manufactured in shaft kilns. Only one cement mill was damaged by bombing and that only because of its location close to a bombing objective. Magnesite refractories are used in cement plant kilns.

Rotary Lime Kilns

W. R. Cliffe, Hershey, Penn., opened his paper, "Producing Lime in Rotary Kilns," by stating that he was taking the opposite stand to Victor J. Azbe, and was speaking in support of the rotary kiln. Mr. Azbe had addressed the Industrial Minerals Division, C.I.M.M., a year ago at Quebec, mainly on the subject of shaft lime kilns, basing his paper upon his many years in the design of such kilns.

Mr. Cliffe said that the controversy between the relative merits of the two types of kilns has intensified in the minds of lime plant operators and that there was need for clear cut analysis of the advantages and disadvantages of the opposing types at this time. He challenged Mr. Azbe's standard for comparison of rotary versus shaft lime kilns, and said that the return on the investment is the correct standard on which comparisons should be based. Mr. Azbe has said, according to Mr. Cliffe, that performance should be measured by a practical standard and that standard should be initial cost and per ton cost of making lime.

(Continued on page 102)

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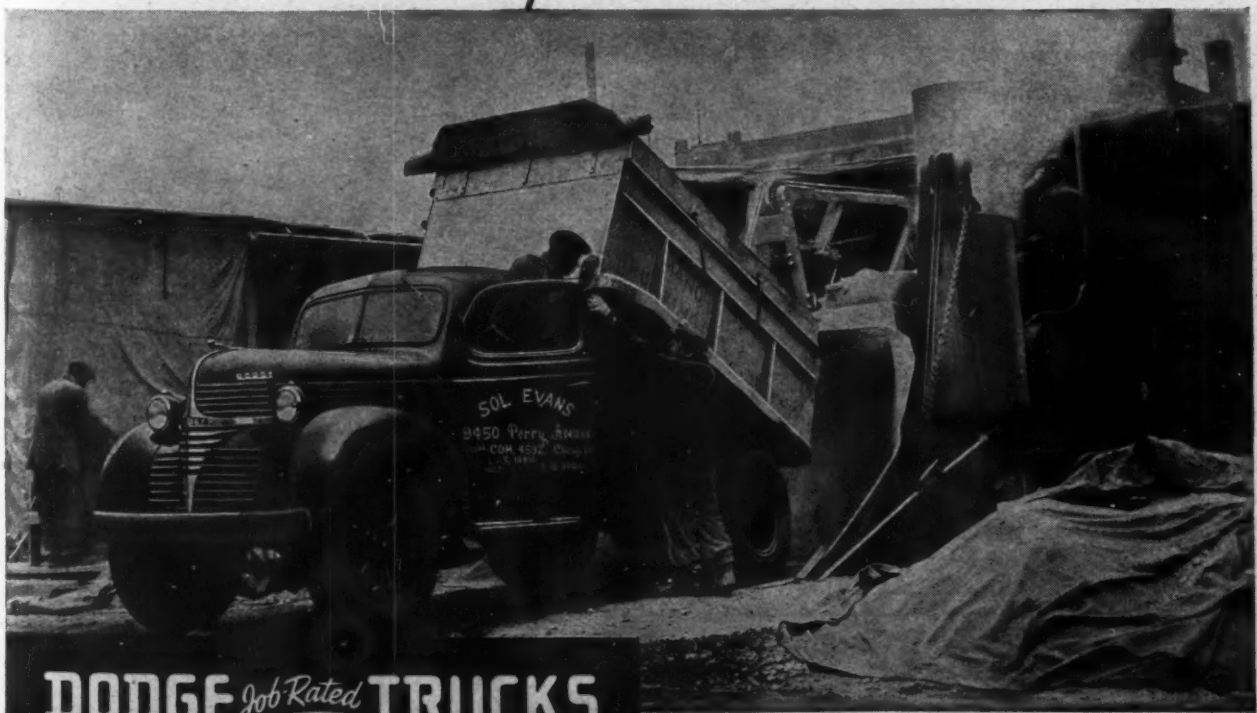

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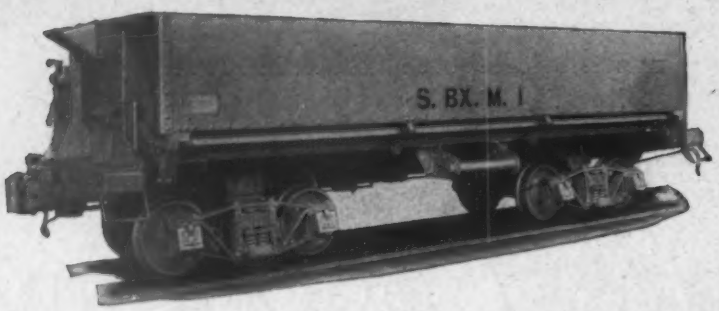

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Rotary Lime Kilns

(Continued from page 100)

Mr. Cliffe claimed that better lime was produced by rotary kilns and he pointed toward an increasing demand for rotary kiln lime before launching into a step by step comparison of all stages in plant operation that enter into production of lime, as they are affected by the type (shaft or rotary) of lime to be produced. In any comparison of the two processes, he said that the tendency has been to consider only the calcination process, which he considers only one phase in the plant operation.

In considering quarry operation, he said that the modern, faster gelatinous dynamites increase the production of fines, which are troublesome in shaft kilns but cause no difficulty in rotary kilns. In shaft kiln plants he said that there is nothing to prevent hand loaders, working on a contract basis, from forking everything into cars. The result is blocking of the kiln gases and segregation within the kiln, he said, with the large particles moving to the kiln walls, resulting in localized excess temperature close to the lining. On the other hand, he said that in rotary kilns the fines are wrapped up in the product, with much less formation of serious cores.

Another disadvantage claimed for vertical kiln operation was that something like 30 percent minus 3-in. stone is produced when stone is crushed to minus 10-in. size for kiln feed, in arriving at a 3- to 10-in. desired size of feed. This production must be disposed of or the alternative is to cut down the size of feed with attendant disadvantages in the kiln. In rotary kiln operation he mentioned that fine sizes are just as easy to burn as larger sizes. The recommended range was four sizes within the limits of ⅜- to 1½-in. No more than 5 percent spalls will be created, according to Mr. Cliffe, and there is the advantage in small sizing that most of the stone is available commercially. He said that due to difficulties in storing and handling vertical kiln feed stone, no stored surplus for breakdowns can be provided in those plants. He also stated that in feeding shaft kilns on a batch basis, draft changes come with the opening and closing of the doors with loss of control over burning. The rotary kiln operation, he emphasized, is a continuous process which enables control of exit gas temperatures within a range of 40 deg. F. The addition of a secondary crusher and screen, necessary to rotary kiln operation, will balance the skips or cars in shaft kiln operation in his opinion.

Going further, because of the intervals between drawoffs from vertical kilns, he said that three types of lime actually are drawn—underburned, satisfactorily burned and overburned. One of the hidden costs

(Continued on page 104)

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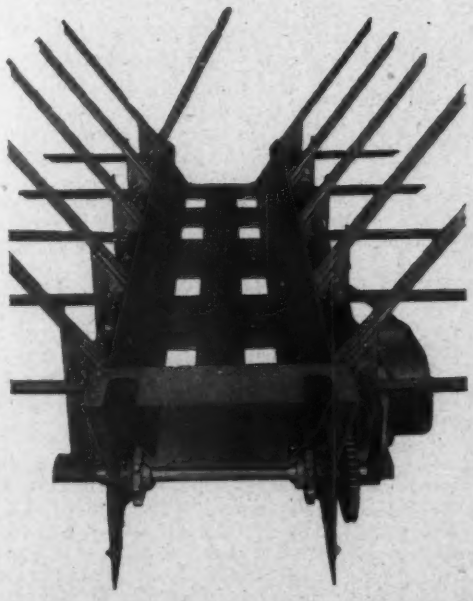

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Rotary Kilns

(Continued from page 102)

overlooked, he said, was the picking of cores and rehandling of lime after the picking process.

Mr. Cliffe stressed the control of heat and draft conditions in rotary kilns, overall operating efficiency, the simplicity of employing direct-firing equipment, automatic instrument control and various devices to regulate operation. Among them are CO_2 + O_2 gas analyzers, louvre dampers, fuel adjustments, etc., with the control panel being the heart of the kiln operation. He believes that producer gas as used to fire shaft kilns is tricky and inefficient.

He conceded an advantage to vertical kilns, in discussing lining and insulation. Cost for replacement of lining in a rotary kiln is 25 cents per ton as compared to 10 cents for vertical kilns, he said. That modern rotary kilns now equal the best shaft kilns in thermal efficiency was claimed. Due to improved heat exchange and automatic instrument control, lime can be burned at 5 million B.t.u. or less in a rotary kiln, he said, and with a heat consumption of 7½ million B.t.u. for wet sludge.

In his comparison of initial cost, he said that a 100 t.p.d. rotary kiln plant would cost $225,000 ($2200-$2300 American dollars per ton of daily output), approximately twice that for a shaft kiln plant. At 6 percent per annum depreciation charge, that would be 45c per ton on the basis of a year as compared to 22½ cents. This difference, he said, would easily be offset by the saving in labor, which is double or three times as much in vertical kiln operation. In concluding, he claimed that rotary kiln lime slakes better and is a better all-around product. The only thing in favor of the shaft kiln, in his opinion, is lower initial cost. He conceded that shaft kilns have their place but, he said, for capacities too small for practicability with rotary kilns.

An interesting discussion developed following his presentation. He mentioned that rotary kilns up to 425 ft. in length are now in use. Best thermal efficiency he has observed has been with 292-ft. rotary kilns which are equipped with heat exchangers and perform with 500 deg. F. stack temperature. Shorter kilns are to be equipped with refractory heat exchangers, he said. He mentioned a 175-ft. rotary kiln equipped with a stone preheater that operates at a fuel ratio of 4.6 to 1.

In reply to a question on soaking of lime, he said there would be no recarbonation in soaking pits even if 6 to 10 percent CO_2 were generated at the end of the kiln, through maintaining sufficient draft to keep the CO_2 coming off. In reply to a question on plasticity of the lime, he presented figures in favor of the rotary kiln product and mentioned the increased volume of hydrate per unit of weight when made from rotary kiln lime. Weight per cubic foot would be about 23 lb. for the rotary kiln product as compared to 30 lb. for shaft kiln hydrate, he said.

Kiln ring formation in rotary kilns came in for considerable discussion. Rings are formed, said Mr. Cliffe, in proportion to the way kilns are pushed for production. He mentioned a rotary kiln in Pennsylvania, designed for 105 t.p.d. of lime, that was pushed up to 175 t.p.d., resulting in the formation of slag rings that presented a real problem. The kiln in this case would close up in 5 to 9 days, requiring a shutdown for removal. Firing shells, the use of pokers or the Cardox (CO_2) process were mentioned as means for removal. There might be a shutdown for an hour or more which would be followed by production of a contaminated product for several hours after start up, with the employment of extra pickers until the condition clears itself.

Formation of slag ring is accelerated with finer feed, he said, largely due to particles being incandescent when they reach the point of impingement where the lining may be sticky. Fuel requirement is less with finer feed, he said. In reply to further questioning on efficiency, he said that when the 105 t.p.d. kiln previously mentioned was pushed to produce 175 t.p.d., exit gas temperatures were increased and the fuel ratio dropped to 3:1. In conclusion he said that kiln length in itself was not the answer to high thermal efficiency. Kilns up to 425 ft. length have been known to have very little saving over 175-ft.

Roofing Granules

Consumption of roofing granules in Canada has increased four-fold in the last ten years and is slated for further expansion, according to V. L. EARDLEY-WILMOT who presented a paper on "The Roofing Granule Industry." There are 14 plants in Canada, and the annual consumption is 77,000 tons valued at over 1½ million dollars, yet 62 percent of the total used is imported. Production started in 1930 and the first colored granules were produced in 1931. U. S. production is about one million tons valued at over 12 million dollars.

Corundum

A. G. ROACH presented a paper on "Craigmont Corundum" similar to one he read before the A.I.M.E. meeting in Chicago earlier this year. Mr. Roach has had under his supervision the production of corundum concentrate from tailings at Craigmont in Renfrew county, Ontario, a war project started in 1944. Concentrate has been shipped during 1944 and 1945 to an abrasive plant in the United States for use in grinding and polishing high precision lenses for optical instruments. Most of the world production for the past 25 years had come from Transvaal.

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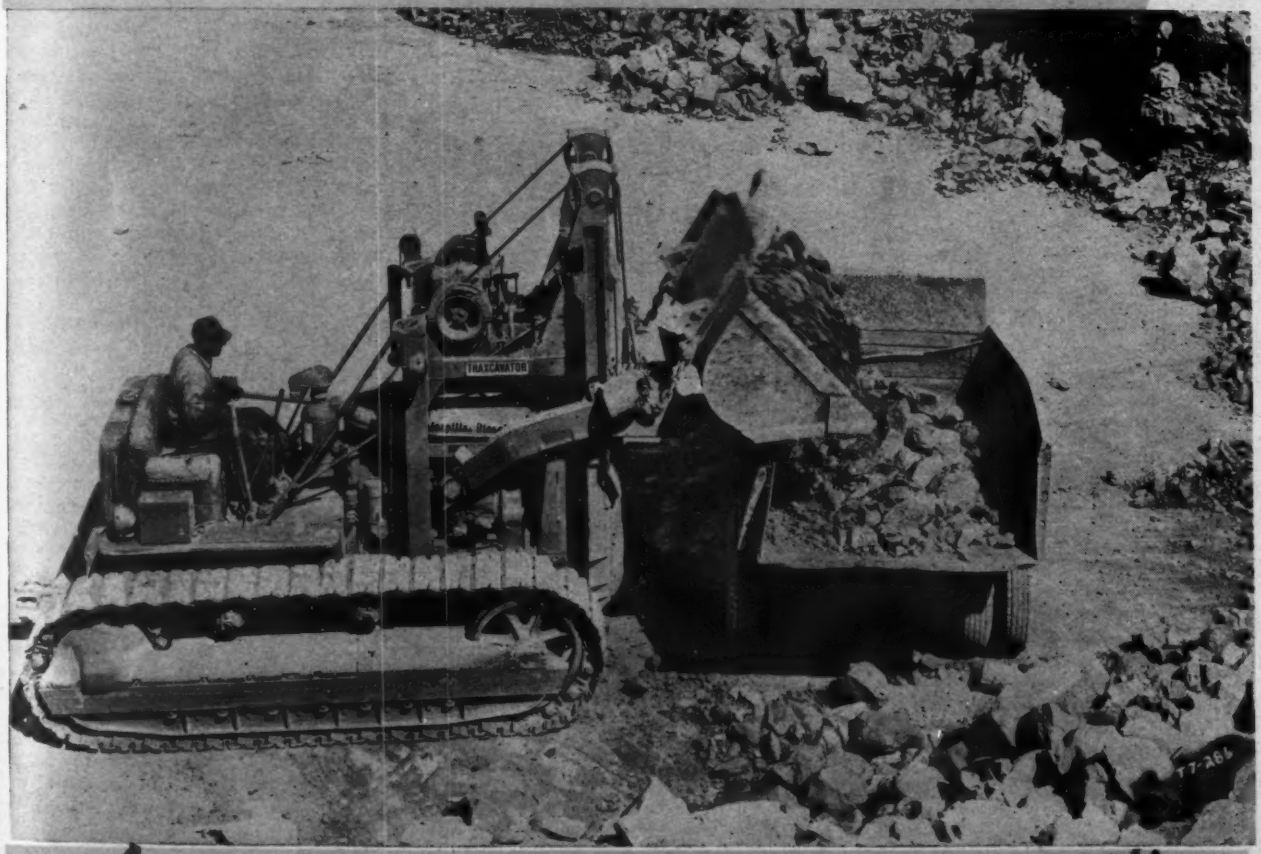

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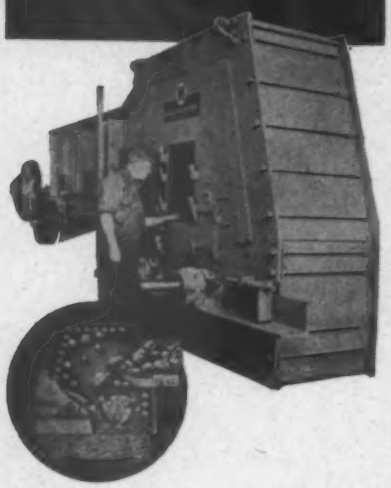

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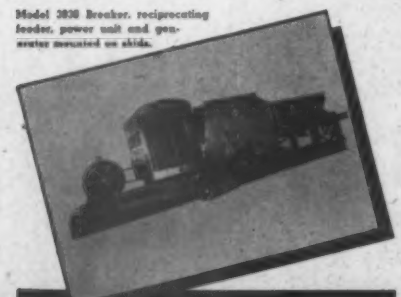

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Lime Association Convention

(Continued from page 74)

There was general agreement that we are facing changed conditions and that all employers must do their best to analyze the situation and adopt their practices to it. There, too, was general agreement that labor unions as well as management should have responsibility for respecting contracts entered into in good faith. In drawing up new contracts care should be taken to see that they contain clauses securing the rights of management.

Research

PROF. WALTER C. VOSS, Massachusetts Institute of Technology, Cambridge, Mass., presided at the session on research problems. The first subject discussed was "Lime in the Construction and Process Industries, and Report of the National Bureau of Standards Fellowship," by DR. G. J. FINK. He described three-and-a-half years of work at the Bureau, having to do largely with cement-lime mortar investigations. Space in this issue does not permit an adequate abstract, but we will have one in a later issue.

Dr. Fink, who is a chemist and was formerly in charge of research on all phases of lime for the Association, concluded his report with some very interesting comments on lime in general.

A more complete abstract of Mr. Fink's report will appear in the next issue.

Construction

DOUGLAS E. PARSONS, chief, Clay and Silicate Products Division, National Bureau of Standards, Washington, D. C., made some informal remarks about the value of industrial research in general and in the construction industry in particular. He said British research on building materials during the last two decades was especially notable. In the United States there is no such central agency which covers the entire construction field. Hence, Mr. Parsons said, there is a greater burden for each individual field of industry to bear. He said the Russian Government was now organizing building construction research on a gigantic scale. Plans for American industry as a whole show that most of them are expanding research programs. Research pays best, he said, when coördinated and planned for long range. Some attempts or experiments may prove duds, but at least one success may repay all costs.

Mr. Parsons, whose specialty at the Bureau of Standards until recently was masonry and plaster, said the lime industry must give thought to changes in building labor practice in the past 40 years. Some of these have been thinner walls, speed, poorer construction and worse workmanship than heretofore. More is expected with present thin wall construction than was formerly demanded of thicker walls. He said some hydrated limes do not give results wanted; but that for limes which do give results, there is a more intensive demand. He congratulated the National Lime Association on its new specification for special (processed) lime hydrate, as it was far in advance of any Federal or A.S.T.M. specification.

After describing the characteristics of good mortar and good plaster, Mr. Parsons discussed the main objectives of industrial research somewhat as follows: (1) More or less defensive; (2) plant research — particularly ascertainment of the conditions limiting satisfactory service of a product; the closer these limits can be determined the better; fear of unsatisfactory service is what has retarded more use of high-limed mortars; when limitations have been definitely established, there must be specifications precise enough to aid the buyer.

Sewage and Waste Treatment

DR. WILLEM RUDOLFS, professor, Department of Water Supply and Sewage Disposal, Rutgers University, New Brunswick, N. J., discussed the lime research problem in relation to present agitation for sewage and water treatment. He reviewed the progress made to date and then the possibilities for an expanded market for lime in this field. He said there was an ever increasing tendency on the part of the public to demand clear rivers and streams by eliminating pollution.

This tendency, he said, was in the direction of Federal legislation for control of stream pollution, but he did not think this group of clean water advocates would be entirely successful. There is a possibility, however, that authority will be given the Federal Public Health Service, in conjunction with the various states, to exercise some control over the pollution of all navigable waterways. The Federal Government's authority may be merely to indicate the necessary measures and leave it to the state authorities to carry them out.

There is a growing demand, Dr. Rudolfs said, for state legislation on pollution of streams, particularly in the East and Central West. While the South is more backward in this respect, he said he had recently assisted in writing legislation for the State of Mississippi.

In the treatment of sewage, he said, the field is somewhat limited. Out of some 6800 plants only some 190-odd are strictly chemical-treatment plants. However, many others use chemicals incidentally. There is a certainty of expansion in the treatment of sewage, and the amount of treatment, or purification, in individual cases will increase, but Dr. Rudolfs does not expect a great increase in

(Continued on page 108)

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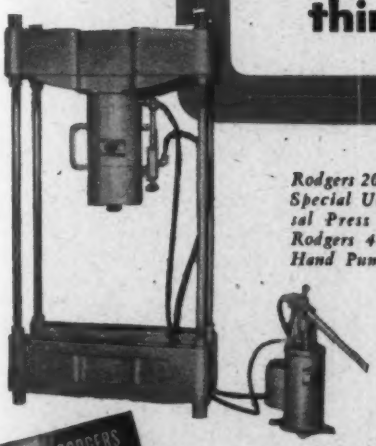

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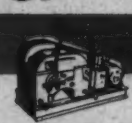

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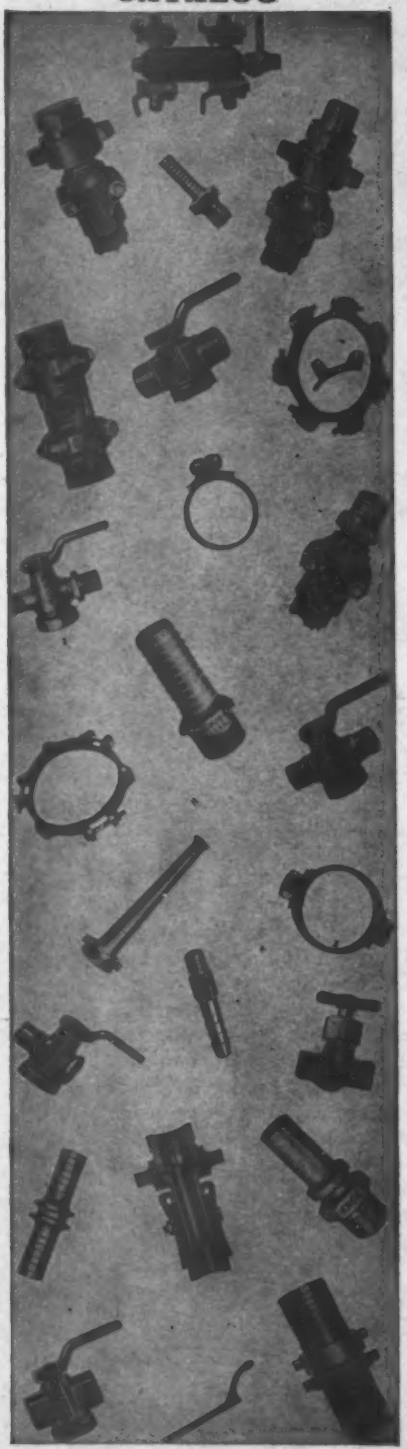

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Lime Convention

(Continued from page 106)

plants using chemical treatment—it will not replace the more popular biological treatment. The reason is that chemical treatment introduces a serious problem of sludge disposal. Vacuum filters are being used more and more to dewater the sludge, and lime is used to aid the operation in most such plants from time to time, if not continuously. So, while there is little possibility of a rapid growth in the use of lime in sewage treatment, there is every prospect of a steady growth.

As to trade wastes, Dr. Rudolfs put them in three classifications: (1) chemical industries, the wastes from which are merely acid and require only neutralization; (2) acidic wastes containing organic or inorganic materials, such as pickling liquors of steel plants; (3) canning and vitamin plant wastes, which have a high oxygen demand, but are seasonal; consequently biological treatment is not adapted to these. Each of these waste disposal problems has its particular aspects, but wherever lime is used for neutralization of the acids a sludge problem is introduced, which makes dumping into sewers objectionable. Research in the lime industry on this problem, Dr. Rudolfs said, might well be directed to finding a drainable sludge.

Treatment of paper-mill wastes is another pressing problem—the so-called "white water." The Pulp and Paper Association is working on this problem. It has been found that judicious use of lime is helpful. A recent development is the possibility of using both magnesium lime and limestones for this waste treatment.

Another field for investigation, according to Dr. Rudolfs, is that of equipment used to feed lime for neutralizing purposes. It is very important in many processes that such feeders give satisfactory service. A survey of such equipment is under way. The lime industry may find it necessary to employ a field man who can demonstrate the installation and use of proper feeders.

"Micromeritics of Lime"

PROF. HOWARD R. STALEY, Massachusetts Institute of Technology, gave an informal discussion, largely by use of lantern-slide illustrations, of some of the peculiarities of fine particles of limestone and lime. It was in the nature of a progress report, but it was highly interesting in showing how an intelligent researcher becomes intrigued with some of the problems the lime industry presents. He could not find any distinguishing characteristics of limestone which would tell anything about the lime it would make; chemical analysis is still the best guide.

In studying lime pastes in an attempt to evaluate workability he found many new and curious facts. For example, the flow of dry hydrate in air in chutes built up a static electrical potential of about 15 volts on one side of the chute. This may have important implications in manufacture such as in the use of air separators. There is also a tendency for hydrated lime particles in the dry state to flocculate. Prof. Staley said most of this work was preliminary and exploratory only, because it involves measurements of surface area, etc., for which adequate tools are not yet available. One interesting practical fact was brought out; that the surface area of a wet lime hydrate (or putty) made from a hard-burned lime was much greater than from a soft-burned lime.

The discussion was concerned chiefly with the meaning of particle size and surface area. Since a lime particle is not only extremely small but porous, some of the surface area is internal as well as external. DR. R. W. MCALLISTER said surface area is very important because it affects the speed of chemical reactions. He highly commended Prof. Staley's discussion as a most valuable and illuminating one.

Agriculture

With H. D. BRIGSTOCKE presiding, DR. FIRMAN E. BEAR, chairman, Soils Department, New Jersey Agricultural Experiment Station, New Brunswick, N. J., made one of his informal talks about soil problems, for which he is famous. He sketched the changes that had taken place on this continent in the few hundred years since European white men took over, and wastefulness of their methods of agriculture. The title of his formal paper was: "Why We Need to Use More Lime." It will be published in a later issue.

Wage-Price Policy

WILLIAM L. PRINGLE, head, Mason Materials and Refractory Section, Building Materials Price Branch, O.P.A., Washington, D. C., made some off-the-record remarks about the problems of pricing, stressing that it is really a democratic development, and would eventually become a science—the science of equitable distribution without too much holding back of business aggressiveness.

Safety Contest

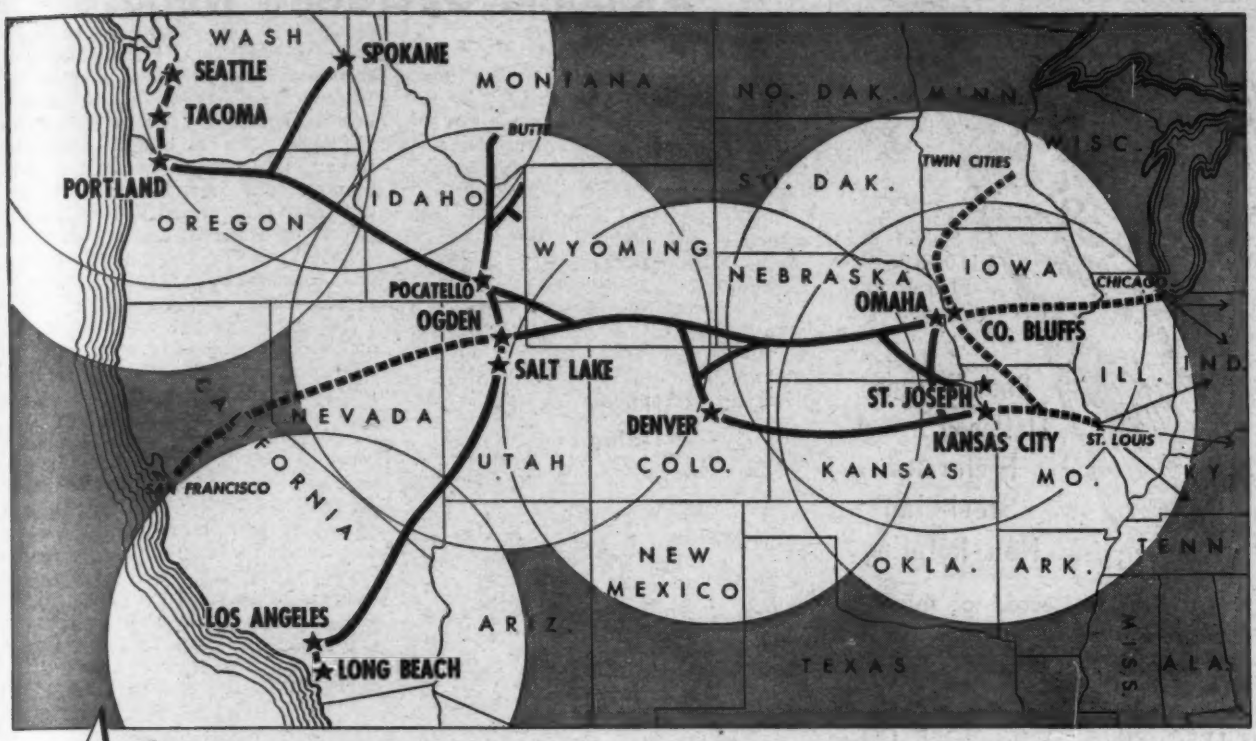
ROMA MEDFORD TURPEN, assistant secretary of the Association, reported the results of the 1945 Safety Contest, conducted under the auspices of the Bureau of Mines. The four plants which will receive awards for a year of no lost-time accidents are:

Martinsburg, W. Va., plant of the North American Cement Corp.

Thomasville, Penn., plant of the J. E. Baker Co.

Thornton, Ill., plant of the Marblehead Lime Co.

Houston, Tex., plant of the Nyotex Chemicals, Inc.



Opportunity for Industry

The western territory served by Union Pacific is rich in countless raw materials required by industry; has power and other necessary facilities; has a high type of native-born labor. Here lies the opportunity for industry to build and expand.

Among the principal industrial tracts owned or served by Union Pacific are those located in, or near by, the following cities:

Omaha, Neb.	Ogden, Utah
Council Bluffs, Iowa	Portland, Oregon
St. Joseph, Mo.	Seattle, Wash.
Kansas City, Mo.-Kans.	Tacoma, Wash.
(Fairfax District)	Spokane, Wash.
Denver, Colo.	Los Angeles, Cal.
Salt Lake City, Utah	Long Beach, Cal.

As the map shows, all these cities are located on the main lines of the Union Pacific Railroad.

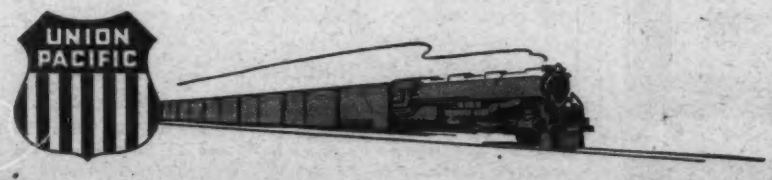
The circles on the map indicate 500-mile distribution areas. In normal times, Union Pacific operates a fast, merchandise freight (L. C. L.) service within these short-haul areas, with door-to-door pick up and delivery service.

These industrial properties are improved and occupied by many diversified manufacturing and commercial enterprises.

Necessary utilities are available and each tract is served by adequate industrial trackage. Whenever required, additional trackage can be provided.

You are cordially invited to write W. H. HULSIZER, General Manager of Properties, Union Pacific Railroad, Omaha 2, Nebraska, regarding industrial districts in territory served by Union Pacific.

be Specific – say "Union Pacific"



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Alabama Operating Trends

(Continued from page 86)

quarry floor and swings through an arc so that the advancing face is semi-circular and, as it cuts, it leaves a smooth vertical wall. Annual capacity is about 1,000,000 bbl., manufactured in two 9- x 150-ft. kilns.

There are two cement plants in Alabama, the Southern Cement Co. in the Birmingham district, and the Cheney Lime and Cement Co. at Allgood, manufacturing a puzzolana non-staining cement by mixing granulated blast furnace slag of a high-calcium composition with hydrated lime and grinding the mixture.

Slag

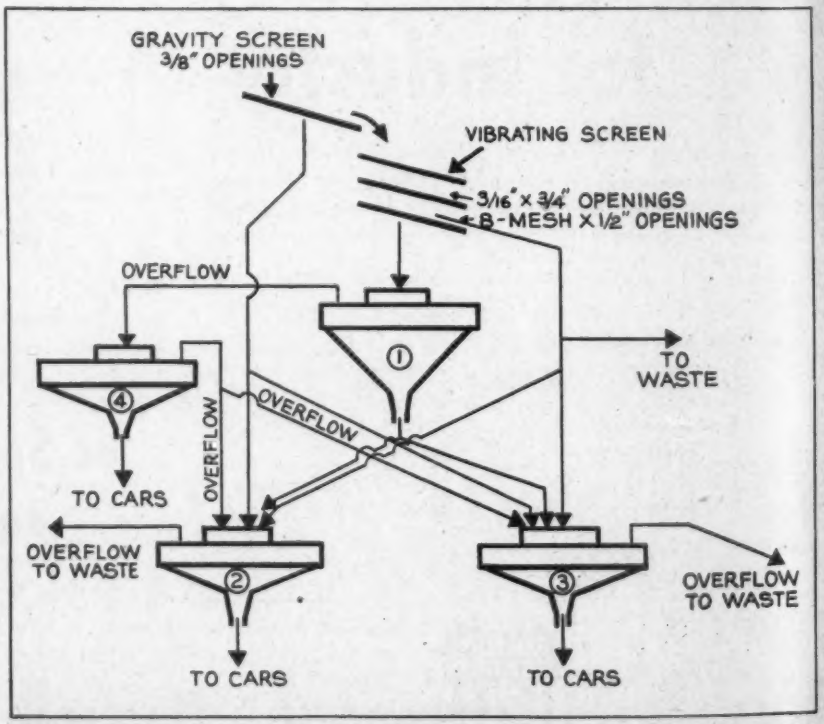
Slag is an important aggregate in Alabama, and is produced as a by-product of steel mills by three companies: Birmingham Slag Co., Sloss Sheffield Steel and Iron Co., and Woodstock Slag Co.

Birmingham Slag Co., operating three plants in the Birmingham area, has an annual output of about 3,000,000 tons. At the Ensley No. 1 plant, slag received from the T.C.I. steel mill, is dumped into three pits, each with a capacity of about 60,000 tons. Slag is picked up from the pits by a Marion 125-ton electric shovel and loaded to 50-ton capacity Sanford-Day drop-bottom cars, which move the material to the plant over standard gauge track by a third rail system. The cars discharge into a hopper equipped with a feeder for regulating the flow over a scalper screen. Oversize drops into a 7-ft. Symons cone crusher while throughs drop into a surge bin where they are joined by the crusher throughs.

Feed from the surge bin is to 8-cu. yd. skip cars, pulled up an incline by a cable-hoist, and discharged over a series of screens and secondary crushers for the production of ten sizes. Any specified material may be produced from the ten sizes on a blending belt under the bins.

At the Ensley No. 5 plant, slag is received from the nearby T.C.I. steel mill and dumped into pits in the same manner as the No. 1 plant. Slag is moved to the plant by drop-bottom cars which discharge into a 75-ton capacity hopper. Feed from the hopper is to a scalping screen, oversize dropping into a 7-ft. Symons cone crusher, throughs going into a surge bin and joining the crusher throughs in the bin. The surge bin sends slag to a long belt conveyor for movement to the main crushing and screening plant where ten sizes are produced over a series of double- and triple-deck screens with two 4-ft. Symons cone crushers for reduction.

(Continued on page 112)



Concrete and masons' sand is reclaimed in the four classifiers. Sand passing the gravity screen passes by split feed to classifiers No. 2 and 3. Sand passing the lower deck of two vibrating screens in parallel goes into classifier No. 1. Product retained on the lower deck of the two vibrating screens is split to classifiers No. 2 and 3 when concrete sand is produced, or is sent to waste when mason sand is produced. Product from classifier No. 1 is split to classifiers No. 2 and 3, while overflow from No. 1 passes to No. 4 where mortar and brick sand (passing 30-mesh and retained on 50-mesh) is reclaimed. Overflow from No. 4 passes to No. 2 and 3, and overflow from 2 and 3 is flumed to waste. Product from No. 2, 3, and 4 is sent to railroad cars for shipment. Montgomery Sand and Gravel Co.

Productive Power

INTERNATIONAL HARVESTER

THIS big quarry and crushing plant, owned and operated by the Smith Brothers, Contractors, of Vancouver, Washington, has a capacity of 80 yards an hour. Here's a big operation that makes full use of four International Diesel Crawlers, two TD-18's, a TD-9 and a TD-6, for all kinds of material and dirt-moving jobs—the heavy work that must be done at rock-bottom cost.

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Your International Industrial Power distributor will be glad to show you all the desirable features of International Diesel Crawlers. Visit him soon and get the facts about productive power—INTERNATIONAL POWER.

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This Diesel powered Hetherington & Berner portable asphalt plant is engineered to give the volume, uniformity and economy of production which is needed for profitable peace-time operations. The Diesel power unit permits all units of the plant to be individually motor driven, thus eliminating many chains and countershafts and reducing maintenance costs. It also makes the operator independent of local power sources. Sectional type construction makes for quick assembly and disassembly, and for complete portability.

H & B builds portable and stationary asphalt plants of all sizes, types and capacities. Write for literature on the type of plant in which you are interested.

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Engineering Service

FARREL-BACON
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Alabama Trends

(Continued from page 100)

As at the No. 1 plant, a blending belt under the bins enables production of any specified material. The belt discharges over a washing screen before the slag is loaded into cars for shipment, and the cars are moved back and forth under the screen to permit even loading, thus eliminating as much segregation as possible. Sizes produced and stored in the ten bins are: 1- to ¾-in.; ¾- to ½-in.; 7/16- to ¼-in.; ⅝- to ¼-in.; 28-mesh to dust; ¼-in. to 10-mesh; ⅜-in. to 10-mesh; 1¼- to 1-in.; 1½- to 1-in.; and 2½- to 1½-in.

Adjacent to the plant is a company-owned ready mixed concrete plant, which can be fed with aggregate from the slag plant directly from the blending belt or by belt conveyor and bucket elevator from the silo bins.

Located next to the blending belt and receiving aggregates by side discharge from the bins, is a belt conveyor which moves material from the bins to a 5- x 40-ft. rotary cooler or to a bucket elevator, by-passing the cooler, if the slag is not too hot, and then to the asphalt plant operated by the company. The asphalt plant is equipped with a 2-ton Simplicity asphalt mixer. Asphalt production in 1945 was about 75,000 tons of "Enslag Colmix," a cold asphaltic concrete.

Slag for the Thomas plant is received from the Republic Steel Co. mills and is dumped into four pits near the plant. This is the smallest of the three plants and a comparatively simple operation. Slag is loaded into cars from the pits by electric shovel, taken to a 60-ton capacity hopper, and sent by belt conveyor to the screens. The belt discharges over a single-deck scalper screen. Oversize drops to a 5-ft. Symons cone crusher, throughs returning to the conveyor in closed circuit. Throughs from the screen go by belt conveyor to the top of the plant to a double-deck screen, oversize returning to the crusher by belt conveyor and returning to the screen by the conveyor in closed circuit. Material retained on the lower deck goes by belt conveyor to a loading tipple, and throughs from the lower deck drop directly below to a stockpile. A recovery tunnel under the stockpile contains a belt conveyor which carries material to the loading tipple, for loading railroad cars. This is a ballast plant.

The Birmingham Slag Co. maintains testing laboratories at the two larger plants and a crew of seven testing engineers, under the supervision of Don Wendling, chief testing engineer. As a check on quality, samples are taken from every other car for sieve analyses and tests are made to determine weight per cubic foot. Los Angeles abrasion tests, asphalt extraction tests, and many others are also made.

(Continued on page 114)

FILE THIS UNDER . . .

AIR ENTRAINMENT

For improved plasticity and resistance to freezing and thawing

Darex AEA*

*Reg. U. S. Pat. Off.

What is Darex AEA? Darex AEA is a water-soluble air-entraining agent that comes ready to use for addition at the mixer. With Darex AEA, the amount of air entrained in concrete can be controlled, so that after an initial mixing period the air content of the concrete remains relatively uniform.

Easy to use Darex AEA comes ready to use in solution form. There is no mixing—no harsh chemicals required. The use of measured volumes of Darex AEA gives constant, uniform results.

Economical to use Darex AEA is inexpensive and costs only a few cents per cubic yard of concrete to use.

Is not super-sensitive Small variations in the amount of Darex AEA used are not critical and do not greatly affect the air. This makes for safe use, even with unskilled labor.

Gives improved plasticity Darex AEA works on the sand constituent of concrete as an air-entraining agent and does not react with the alkali in the cement. It gives plasticity and workability, which permit substantial water cuts, make the concrete easy to place, tend to reduce bleeding, and eliminate segregation of the aggregates.

Gives improved durability Darex-AEA-treated concretes containing 3-6% entrained air give remarkable resistance to freezing and thawing.

Proved in use Darex AEA has already been used in over four million cubic yards of concrete. This figure is based on sales to consumers.

Use DAREX AEA with confidence wherever air-entrained concretes are specified.

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IN AIR-ENTRAINED CONCRETES IT'S THE *Controlled Air* THAT COUNTS

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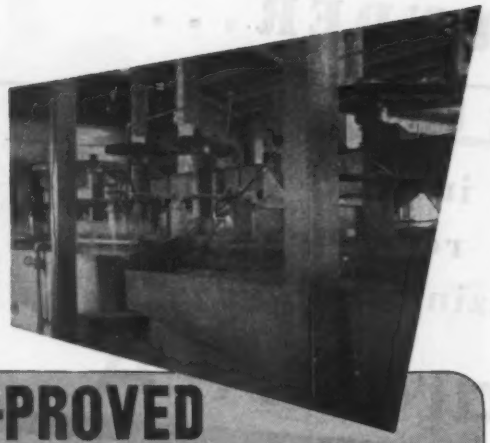

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Easily Adapted to Phosphate Flotation

Like many other successful phosphate operations, Coronet Phosphate Co. uses job-proved Denver "Sub-A" Flotation. Supercharging and double overflow, easily added to the Standard Denver "Sub-A", met all the requirements of this particular phosphate problem . . . giving the larger tonnage and froth removal capacity essential to high metallurgical efficiency in treating this fast-floating, coarse material. Two 4-cell No. 24 Denver "Sub-A's" handle 40-50 long tons per hour of —48+150 mesh material at 40% solids.

Three Repeat Orders for Denver Diaphragm Pumps

Open pit sluicing operation results in an erratic flow of pulp to processing plant. Coronet Phosphate uses 6" Duplex Denver Adjustable Stroke Diaphragm Pumps to positively control this feed to produce a constant flow of pulp to the flotation circuit.

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Golden
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ROCK
PRODUCTS
1896 ● 1946

Alabama Trends

(Continued from page 112)

Slag is produced for aggregate for bituminous pavements, plant mixes, surface treatment, stabilizing material, concrete aggregate, ballast, rock wool (slag wool), roofing granules, filter media, and aggregates for concrete block plants. Specifications for abrasion in Alabama allow a 48 percent loss in the Los Angeles test, and the material produced here ranges from 36 to 37 percent.

About 40 percent of total production is shipped as railroad ballast, and the balance as commercial material. E. T. Quimby is superintendent at the Thomas plant; J. J. Holmes is superintendent at he Ensley No. 5 plant; and J. A. Carnathan is superintendent at the Ensley No. 1 plant.

Slag for Ready Mix and Bituminus Mixes

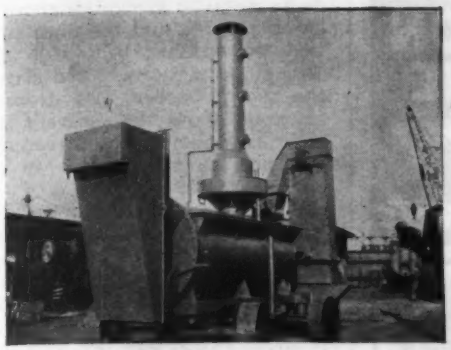
Sloss Sheffield Steel and Iron Co., producing slag aggregate for commercial use as well as for its own ready mixed concrete plant, has a yearly production of about 500,000 tons. The slag plant adjoins the company's steel furnaces, and slag is dumped into four pits next to the furnaces. It is loaded to railroad cars by an electric shovel and moved to a trestle above bins. The bins discharge to a belt conveyor moving the slag to a 7-ft. Symons cone crusher, then by bucket elevator to a series of eleven screening operations and a secondary crusher. It is interesting to note that about half of the slag produced is a hard, dense material, the result of a self-fluxing ore used in the blast furnaces. In relation to the slag produced when limestone is used as a fluxing agent, the self-fluxing ore produces a slag that weighs 95 lb. per cu. ft. as compared to 83 lb. per cu. ft. for the other type of slag.

This plant produces five sizes of slag: 1½-in. to 4-mesh for ready mixed concrete aggregate; 2½- to ¾-in. for sub-base aggregate; ⅜-in. to dust for asphalt topping and for concrete block aggregate; ¼- to ⅝-in. for roofing material and for certain types of cold mix asphalt; and ¾-in. to 4-mesh for special concrete work.

The Birmingham Slag Co. plant at Alabama City is an all-conveyor-belt plant, with about 1500 ft. of belt in use. The raw material is loaded to trucks by a Marion electric shovel and moved to a hopper which feeds a belt conveyor for discharge into the primary crusher, a 5½-ft. Symons cone. Crushed slag drops to a long conveyor which is enclosed in a tunnel under the railroad tracks in the yard. When it becomes necessary to cool the crushed slag, a water spray plays a stream on the material as it is being carried by this belt. The underground belt discharges to an inclined belt which feeds the first screening operation. Oversize mate-

(Continued on page 116)

"A Traveling Lime Plant?"..



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Portable Decontamination Machine

This is one of *three* completely portable hydrate and milk of lime machines recently purchased from LIME & HYDRATE PLANTS COMPANY by the Russian Government.

Although the primary purpose is to furnish a liquid deodorizing material for decontaminating former battle zones, these units will also be used for building operations, orchard spraying, and manufacturing milk of lime for sugar.

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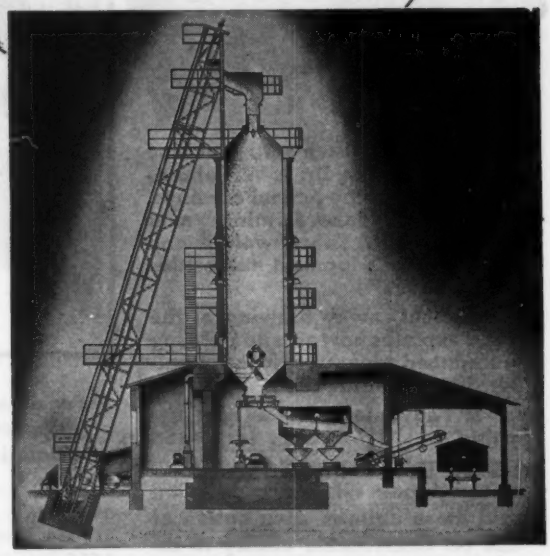
For stationary plants, the KUNTZ Gravity System of lime hydration provides absolute control of the entire process in a single unit.

This method saves up to $1.50 per ton because the patented dust control stops all loss of lime fines.

The KUNTZ System can be applied to any type of hydrate plant. One-man operation. For either batch or continuous method.



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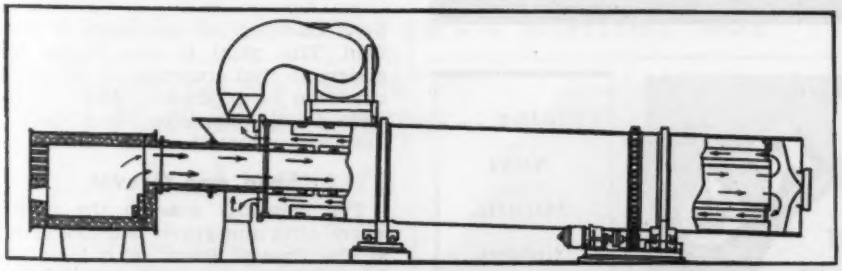
This is *the* modern process that eliminates crushing and insures continuous control.

The York-Kuntz Kiln gives a uniform burn resulting from maximum fuel efficiency.

Features include: mixed feed, center burners, coal or gas firing . . . continuous feed and continuous discharge . . . center load support . . . adjustable distribution.



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Double shell permits hots gases to dry and pre-heat the stone by radiation.

Gases absorb moisture in inner flue, insuring high thermal efficiency and fuel economy.

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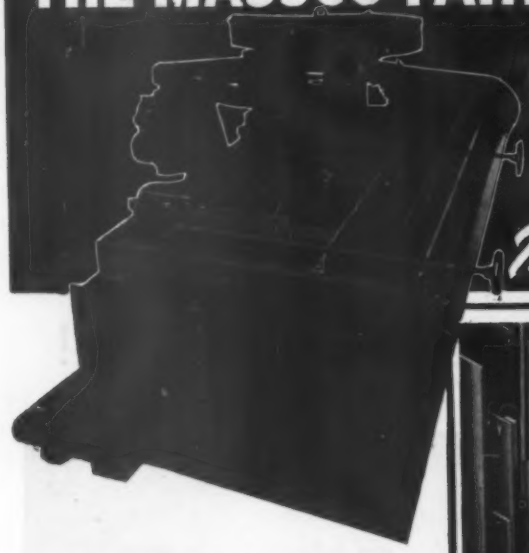
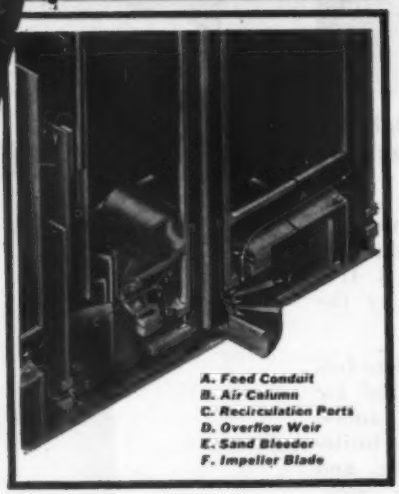
THE MASSCO FAHRENWALD *a new* FLOTATION MACHINE *embodying basic Improvements*





A. Feed Conduit
B. Air Column
C. Recirculation Ports
D. Overflow Weir
E. Sand Bleeder
F. Impeller Blade

The Massco-Fahrenwald Machine was designed by Dr. A. W. Fahrenwald, dean of the School of mines, University of Idaho. As mining men well know, Dr. Fahrenwald is one of the world's topmost authorities on flotation.

The cut-away drawing at the right explains how air and pulp are introduced separately to the impeller, instead of together.

The advantages of this new machine are: (1) Greatly increased aeration; (2) More air per unit of power input; (3) Better diffusion and more uniform distribution of air; (4) Remarkable ability to increase aeration with feed overloads; (5) Easier servicing of machines; (6) Increased life of parts.

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Genuine Wilfley Tables; Massco-McCarthy Hot Millers; Rock Bit Grinders; Density Controllers; Belt Feeders; Pinch Valves; ASSAY AND LABORATORY SUPPLIES AND EQUIPMENT; COMPLETE MILLING PLANTS.

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Coming . . . Next Month, Golden Anniversary Issue ROCK PRODUCTS 1896 ● 1946

(Continued from page 114)

rial scalped off on the top deck of this triple-deck screen is carried by another belt to a recrushing operation, material retained on the other decks drops to stockpiles above a recovery tunnel, and the fines are carried by another belt to a second screening operation. Sized slag from the second screen also drops to a stockpile above the recovery tunnel. Oversize which has been recrushed is returned to the screens in closed circuit.

Slag sent from stockpiles to the belt in the recovery tunnel is moved to a single-deck washing screen where it receives the final washing before being loaded to railroad cars for shipment. Capacity of this plant is about 38,000 tons per month.

Quarry Operations

Dolcito Quarry, at Tarrant City, produces flux stone for the steel mills as well as agricultural limestone. This quarry is in the Ketona dolomite formation and yields a stone that has a calcium carbonate equivalent of 106 percent. Until 1945, blasting methods consisted of shooting the 135-ft. face in large blasts, but with the recent development in the community of homes, smaller shots have become necessary. Consequently, the quarry floor is now lowered in 20-ft. benches. To reclaim stone from the quarry, and to allow trucks to travel on the original quarry floor, a Marion dragline is used. The dragline rests on the original floor and reclaims stone from the lower 20-ft. level, loading trucks which move material to a primary crusher in the quarry.

Material from the crusher is moved to the upper plant by skip cars pulled by cable hoist which discharge into a secondary crusher, then to a series of screening and recrushing operations which allow production of flux stone or agstone, as the market demands. This plant is one of the few in the country that uses a tube mill to produce a fine aggregate. The plant has a capacity of about 1000 tons per day.

Another quarry producing flux stone for the steel mills is the Alabama Aggregates Co., at Cobb City, near Gadsden, a newcomer in the field. This plant is also flexible in design, so that a number of different sizes can be produced. (More complete details regarding these operations will appear in a later issue.)

Sand and Gravel

The principal area in the State where sand and gravel is available is in the Coastal Plain, with most of the production emanating from the Montgomery vicinity. Roquemore Sand and Slag Co. and Montgomery Gravel Co., both subsidiaries of the Birmingham Slag Co., have plants in or near Montgomery.

At the Roquemore plant, the pit deposit is loaded into 15-cu. yd. side-dump cars which are moved over standard-gauge track to the plant by

TOUGH PUMPING JOBS

CARVER PUMPS are designed and built to stay on the job for hundreds of hours—always fast-priming and non-leaking—even when the water is filled with sand, silt or dirt. Mechanical seals have wearing surfaces made of tungsten-carbide—almost diamond-hard—and consequently are practically immune to wear. Impeller and suction head are also made of wear-resisting material to provide long life and efficient performance. Simple design and few working parts assure lower operating and maintenance costs. Carver self-priming centrifugal pumps are available in a wide range of capacities from 3,000 to 200,000 g.p.h. with gasoline, Diesel or electric power. Dealers in all principal cities.

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Type "MR" 42"x96" Double Deck

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RACINE — WISCONSIN

steam locomotives. Cars dump to a hopper above a belt conveyor feeding the plant. Located midway up the belt is a "picker station" where clay balls and other foreign materials are removed. Preliminary sizing and sand separation is handled by a rotary screen, with gravel discharge splitting to a single- and a double-deck gravity screen.

In 1943, the Montgomery Gravel Co. built a new dry process plant to replace one of smaller capacity that was fed material by dredge. Featured in this plant are Wood Auto-Vortex bowl classifiers for reclaiming fines that are needed to meet Federal specifications for concrete sand.

Two areas are worked, one on either side of the plant. Trucks of 16-cu. yd. capacity are used for transportation from one area, and the other has tram cars pulled on standard-gauge track by locomotives. Since one pit alone could not supply sufficient raw material to meet plant capacity, the second pit was opened and trucks were installed to transport sand and gravel to the plant. Both trucks and cars discharge over a grizzly into a hopper feeding a belt conveyor for movement to the surge pile. Feed from the surge pile, which has a capacity of about 2000 cu. yd., is to a belt conveyor up to the main plant. Here the aggregate enters a feed box together with fresh water and is fed through split discharge to two gravity screens to make preliminary sand separation. Oversize, above ⅜-in., goes to a triple-deck vibrating screen where gravel sizing is made. Two horizontal vibrating screens follow the triple-deck screen.

Interesting Sand Classification

The most interesting feature of the plant is the sand classification system. There are four Wood classifiers, and the pulp passing the gravity screen and passing the middle deck of the triple-deck screen goes into two 14-ft. classifiers located below an 8-ft. classifier or is sent to waste. The 8-ft. tank is fed by sand passing the lower deck of the triple-deck screen, which has ½-in. x 8-mesh openings. The discharge from the bottom of this classifier goes by split feed to the two 14-ft. classifiers, where it joins the feed from the gravity screen and material retained on the lower deck of the vibrating screen, unless that feed is sent to waste. Overflow from the 8-ft. classifier goes to a fourth, 10 ft. in diameter. This is to reclaim mortar or brick sand, passing a 30-mesh and retained on a 50-mesh. Bottom discharge is to railroad cars.

When the feed to the two 14-ft. cones is from the 8-ft. cone only, a mortar sand is reclaimed. When both products—sand passing the screens and the sand from the 8-ft. cone—go to the two 14-ft. classifiers, concrete sand is caught. Overflow from the latter two goes to waste. The sketch, page 110, shows the flow of material into and from the four classifiers.

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Americans are not "all purpose" crushers. Americans are available in models to fit your particular operation. Easily accessible and adjustable for changes of sizing from roadstone to agstone and vice versa. Americans offer a wide range of reduction and a high output—up to 250 TPH. Americans are easily installed in minimum headroom.

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WISCONSIN HEAVY-DUTY *Air-Cooled* ENGINES *on the job* WASHING GRAVEL...

Photograph courtesy of Diamond T Motor Car Co., Chicago, Ill.

The above typical service application shows a Wisconsin single cylinder air-cooled engine *on the job*, in a gravel dredging and washing operation in Mendicino County, Cal.

Wisconsin single and 4-cylinder air-cooled engines, from 1 to 31 hp., are giving good accounts of themselves in a great variety of applications, on many types of contracting and industrial equipment where heavy-duty serviceability and freedom from cooling troubles and attention are important operating factors. Specify Wisconsin Power for *your* equipment.

WISCONSIN MOTOR Corporation
MILWAUKEE 14, WISCONSIN
World's Largest Builders of Heavy Duty Air-Cooled Engines

New Incorporations

Cement Boards, Inc., Stamford, Conn., has been incorporated to manufacture and deal in building materials. Capital stock $50,000, divided into 1000 shares of $50 each. Commence business with $2000. Incorporators are D. L. Ligh, Stamford; Edw. A. Schuster, Brooklyn, N. Y.; and Grace A. Duffy, White Plains, N. Y.

Yellowstone Sand & Gravel, North Fond du Lac, Wis., has been organized to deal in sand, gravel, cement and other building materials and general construction business. Authorized capital 500 shares, no par value. Incorporators are Leo J. McArdle, Woodrow W. Roblee, Earl F. McEssy, and H. W. McEssy.

Asbestos Specialties Corp., Hartford, Conn., has received incorporation papers to manufacture and deal in asbestos cement products. Capital stock $10,000. divided into 2000 shares of $5 each. Commence business with $1000. Incorporators are David H. Jackman, Daniel A. Baldo, and Harry B. Davis, all of New York City.

Montello Granite Products Corp., Montello, Wis., has been incorporated for mining, quarrying, milling, crushing, etc. and dealing in products from these operations, with a capital of 100 shares at $100 each. Incorporators are E. J. and Rose M. Crawford, S. M. Scott, and S. W. Franken, Madison, Wis.

Pompeo Cement Products, Lowellville, Ohio, has received incorporation papers to manufacture cement block. Authorized capital, 500 shares of stock, no par value. Incorporators are William C. Daniel E. and Carmine D. Pompeo.

Moorman Sand & Gravel Co., Middletown, Ohio, has been incorporated, with a capital of 1000 shares of stock, no par value. Incorporators are Arthur Moorman, Edgar B. Moorman and Francis J. Moorman. Attorney is C. E. Burke.

Ussery Sand & Gravel Co., Freemont, Nebr., has been organized with a capital stock of $10,000. Incorporators are John Ussery and Charles Engel of Freemont.

Concrete Products Co., Inc., Ft. Smith, Ark., has obtained a charter listing 1500 shares of stock, no par value. Incorporators are Alvin D. Clark, O. Wilkins and Maxine C. Clark, all of Ft. Smith. Will begin business with a capital of $6600.

Midland Materials, Inc., Fredonia, Kans., has been granted a charter to operate a $40,000 building materials company.

Watkins Concrete Block Co., Omaha, Nebr., has been incorporated by J. B. Watkins and Charles W. Watkins, with a capital stock of $20,000.

Summit Cement Stone Corp., Akron, Ohio, has been organized with 250 shares of stock, no par value. Incorporators are B. M. Shaw, James H. Nacey and Erma Herrick.

Canton Concrete Products, Inc., Cincinnati, Ohio, has been incorporated with 100 shares of stock, no par value. Incorporators are John L. Kronsis, Russell E. Wilson, Harry C. Rollins.

Southeastern Brick Co., Waycross, Ga., has been organized to manufacture concrete block, brick and allied products. Incorporators are R. L. Pittman, Rosser Elkins and B. R. Jones.

Southern Mica Co. of North Carolina, Newdale, N. C., has been incorporated with an authorized capital stock of $100,000 of which $3000 has been subscribed by D. D. Rice and Dorothy B. Rice, both of Johnson City, Tenn., and George W. Edge of Newdale.

Sheboygan County Block & Excavating Co., Sheboygan, Wis., has been organized to manufacture cement block and tile, and any other concrete products in connection thereto, with a capital of 500 shares of common stock, no par value. Incorporators are Arno Sauter, Art Vanderkin and E. H. Schmidt.

Manufacturers' News

Elastic Stop Nut Corp. of America, Union, N. J., announces that Charles E. Heintz, general sales manager, has been elected vice-president in charge of sales. This announcement was made by John R. Munn, president of the company.

Gardner-Denver Co., Quincy, Ill., has announced the return of B. P. Spann as advertising manager of the company after more than 38 months of service in the Navy. When he was discharged, Mr. Spann had the rank of Lieutenant Commander, having risen from the rank of Lieutenant (j.g.).

Caterpillar Tractor Co., Peoria, Ill., has formed a manufacturing development division under the direction of C. A. Matheny, who formerly served as a factory superintendent at the Peoria plant and as works manager of the Caterpillar Military Engine Co. The new division will operate as a section of the general planning department and will screen ideas for the improvement and development of manufacturing processes that originate in various departments throughout the plant.

C. A. Matheny

Wheelco Instruments Co., Chicago, Ill., has made the following appointments: Claude A. Gates, New York City, manager of Zone 1, has been appointed vice-president; C. H. Joy, Cleveland, manager of Zone 2 and at present a director, was appointed vice-president; R. A. Schoenfeld, Chicago, manager of Zone 3 and at present a vice-president, was named a director of the company, while Chas. L. Saunders, vice-president, was made executive vice president. Francis H. Beaupre and Bruno H. Ramthun have joined the application engineering department.

Worthington Pump & Machinery Corp., Harrison, N. J., has appointed P. A. Alers as manager of the El Paso, Texas, office, and Andrew S. Ormsby as director of industrial relations.

R. G. LeTourneau, Inc., Peoria, Ill., has announced the appointment of Oscar W. Nelson as vice-president and general manager of the Peoria plant. He was formerly general manager of the Beaver, Penn., plant, propeller division, Curtiss Wright Corp. He will have responsibility over all Peoria operations, his duties including those formerly handled by Denn M. Burgess, who recently resigned as executive vice-president and director. Prior to his association with Curtiss Wright, Mr. Nelson was vice-president and general manager of the Muhler Co., Milwaukee, Wis.

Oscar W. Nelson

Hendrick Mfg. Co., Carbondale, Penn., announces the return to the company of Robert P. Couch as assistant to Trowbridge A. Warner, sales manager. Mr. Couch has been with the company since 1936 until he entered the Army in 1942.

Lima Locomotive Works, Inc., Lima, Ohio, has appointed Wylie-Stewart Machinery Co., Oklahoma City, Okla., as sales agent for Lima shovels, cranes and draglines in the State of Oklahoma.

Thermoid Co., Trenton, N. J., announces the appointment of H. C. Anderson as director of research.

SAND WASHING
FOR INDUSTRIAL PURPOSES

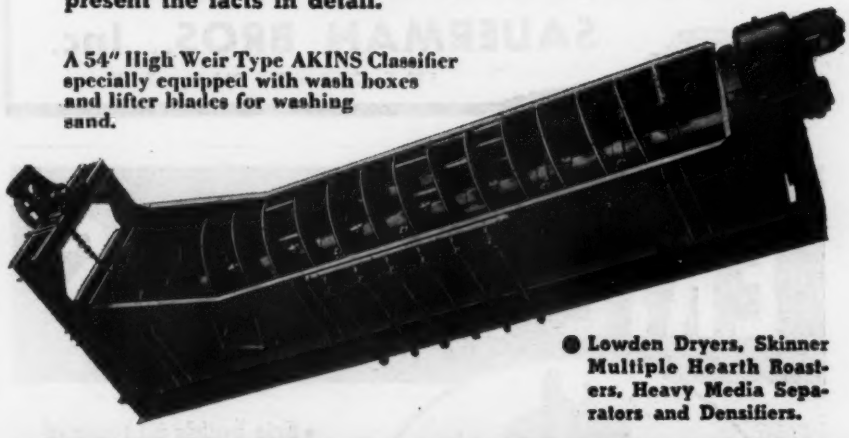
Get Big Tonnage at Low Power Cost

with AKINS CLASSIFIERS

WHEN equipped with wash boxes and lifters on the spirals, the AKINS Classifier becomes an efficient washer for producing special industrial sands to exacting specifications . . . such as required for foundry moulding and glass making.

No elaborate arrangements required. Unloading unnecessary to start after shutdown; power requirements very low; maintenance almost nothing. Let one of our engineers present the facts in detail.

A 54" High Weir Type AKINS Classifier specially equipped with wash boxes and lifter blades for washing sand.



● **Lowden Dryers, Skinner Multiple Hearth Roasters, Heavy Media Separators and Densifiers.**

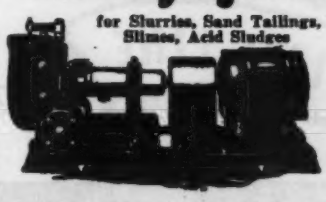
COLORADO IRON WORKS CO.

Main Office & Works Denver, Colo., U. S. A.

Coming . . . Next Month, Golden Anniversary Issue ROCK PRODUCTS 1896 ● 1946

WILFLEY
centrifugal SAND PUMPS

for Slurries, Sand Tailings, Slimes, Acid Sludges



Save Pumping Cost

Continuous operation without attention for long periods. Stuffing box, stuffing, gland water ALL eliminated. Close clearances maintained by easy slippage seal adjustment. Heavy pumping parts of material best suited for YOUR particular problem. Complete engineering service. Prompt shipment of parts. The most efficient and economical pump you can buy. *Write for Complete Catalog.*

A. R. WILFLEY & SONS, Inc. Denver, Colo., U. S. A.

NEW YORK OFFICE: 1775 BROADWAY

CUT YOUR HANDLING COSTS—

with a streamlined CRESCENT Scraper

EXPLANATION OF PICTURE—

Two small Crescent Scrapers handle stockpiles covering ground on both sides of a conveyor running from mill to loading station at a dolomite processing plant.

The scraper in the foreground of the picture is stocking out screenings that are spouted onto the ground from the conveyor. This product is sold to the fertilizer trade with demand coming mainly in the Spring months. Upwards of 25,000 tons accumulates between seasons. The scraper piles up this surplus during nine months of the year and then works overtime in the Spring to retain the stored material.

The other scraper on the far side of the conveyor, has a different task. It stockpiles the overflow of dolomite when the crushers are producing more than the kilns can take care of and it reclaims from the pile whenever quarry or crusher operations are interrupted.

IN gravel excavation, stripping and stockpiling Sauerman Crescent scraper buckets have proved their ability to dig and convey large tonnages of gravel, clay, loose ore, etc., at costs of a few cents per ton.

Secret of this efficiency is in the streamline design of this unique scraper. A "Crescent" penetrates hard materials with ease of a plowshare, and both in digging and hauling it requires less line-pull than any other scraper of equal capacity.

For complete data on the various sizes of Crescent scrapers, methods of operation, etc., write for Catalog 19-J.

SAUERMAN BROS., Inc.

530 S. Clinton St., Chicago 7, Ill.

ERIE BUCKETS

• Erie builds all types of buckets in various capacities and weights to meet the job and operating conditions. Choose the correct bucket for the job and you get maximum speed and output. Write for broadside on the complete Erie line of buckets.

THE COMPLETE LINE

Address
765 Geist Road

ERIE STEEL CONSTRUCTION CO.

ERIE, PENNSYLVANIA

Aggre Meters • Buckets • Concrete Plants • Traveling Cranes

American Brake Shoe Co., New York, N. Y., has contracted to purchase the Progressive Foundry Works, Inc., Rochester, N. Y., subject to approval of Progressive's stockholders. The new plant will be operated as a new division of the company under the direction of W. T. Kelly, Jr., who is also president of the Kellogg Division. Howard S. Van Billiard, president of Progressive Foundry, will remain as manager. No changes in personnel are contemplated.

Robins Conveyors, Inc., Passaic, N. J., has announced that R. W. Eichenberger, vice-president, has moved to the Chicago office to supervise sales in the Western division. He succeeds J. F. Meissner, who has resigned. Mr. Eichenberger joined the Robins organization in 1910 and has served in all phases of sales and engineering work. He was associated for many years with the development of outstanding methods of handling materials. He is considered an expert in the handling of bulk ore, limestone, coke and coal. Mr. Eichenberger will be assisted by E. P. Larsen, who has been a sales engineer in the Western division for several years.

R. W. Eichenberger

The Bristol Co., Waterbury, Conn., has announced the appointment of H. A. Van Hala as district manager of the Cleveland branch office. He succeeds G. H. Gaites who was recently transferred to the New York office as manager.

Denver Equipment Co., Denver, Colo., has announced the election of T. S. Bailey, Jr., as vice-president. He has been associated with the company 14 years and was sales manager prior to his new appointment. As sales manager Mr. Bailey traveled extensively throughout the western hemisphere and has just returned from an extended business survey of Africa and Europe. Continued growth has necessitated expansion programs of the company and foreign manufacturing subsidiaries operating in Canada, Africa, Europe, Latin America and the Far East.

T. S. Bailey, Jr.

ROCK PRODUCTS'

CONCRETE PRODUCTS

and Cement Products

MAY
1946

○ Showing typical casting, curing and storage yard for 11 ft. 6 in. concrete pipe, Lock Joint Pipe Co.

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DIVERSIFIED PRODUCTION

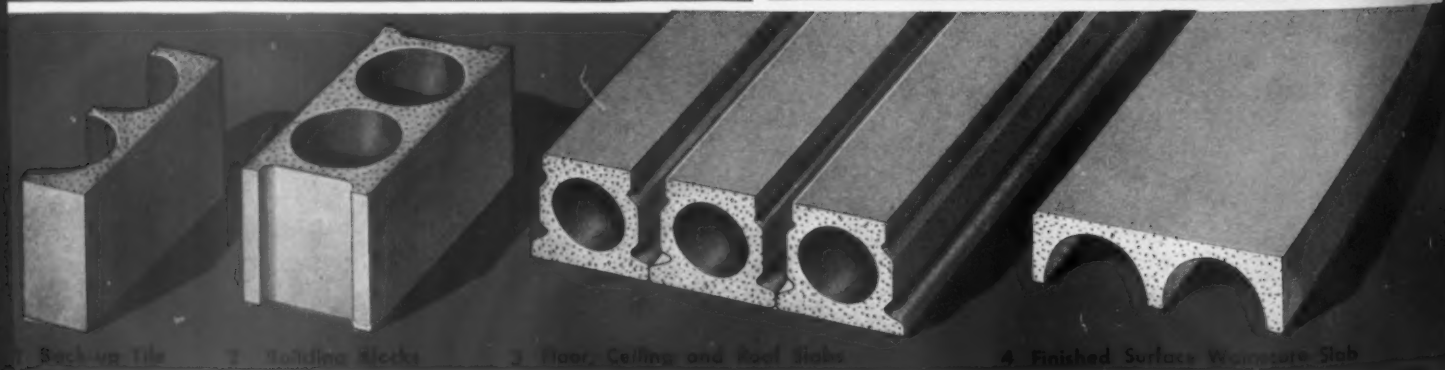
LENDS VALUE TO THE PRESTCRETE FRANCHISE · · · ADDS SAFETY TO YOUR PLANT INVESTMENT.

The high production rates and great diversification of products, attainable with the Prestcrete process, bring many building units, for the first time, to new low-cost levels.

An era of expanded use of concrete building products is at hand. Forward looking business men in the material supply field will find a Prestcrete franchise exactly suitable to the times.

NATIONAL PRESTCRETE, INC.
82 W. Washington St., Chicago 2, Ill.

These are only a few of the many products used in housing construction which can be made in volume production on the Prestcrete machine.

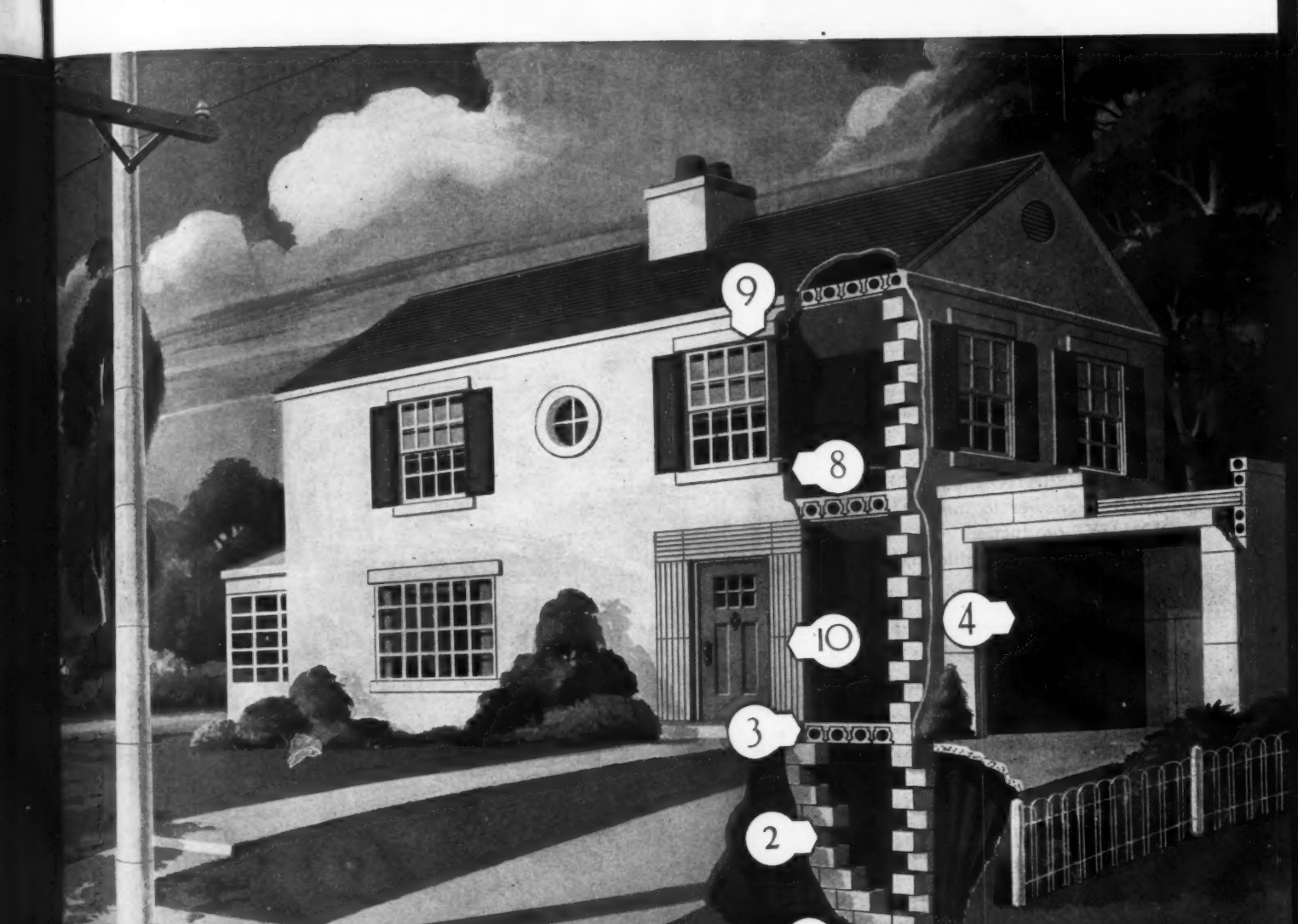


1 Back-up Tile 2 Building Blocks 3 Floor, Ceiling and Roof Slabs 4 Finished Surface Wearcrete Slab

GET INTO THE SWING TO ENDURING, FIRE-SAFE

machine

...MANY PRODUCTS!



AFE CONSTRUCTION WITH **PRESTCRETE**

Super VIBRATOR CONCRETE BLOCK MACHINE

GEORGE SUPER V

CAPACITY 300 BLOCKS PER HOUR

- SUPER VIBRATION is the GEORGE SUPER V answer to the problem of QUALITY production of masonry units. It guarantees uniform, built-to-last blocks.
- SUPER VIBRATION gives a dense outer surface to the finished WATER PROOF block because it allows use of a wetter mix.
- GEORGE SUPER V concrete block machines will operate at a rate of 250 to 300 blocks per hour. Designed simplicity assures LOW COST PRODUCTION.
- Every GEORGE SUPER VIBRATOR block machine and every piece of accessory GEORGE SUPER V machinery is mechanically RIGHT.
- GEORGE SUPER V machinery is ruggedly and honestly built to provide efficiency, economy and dependability.
- GEORGE SUPER V products are built to meet all requirements of block manufacturers and sell at prices that make them money savers.

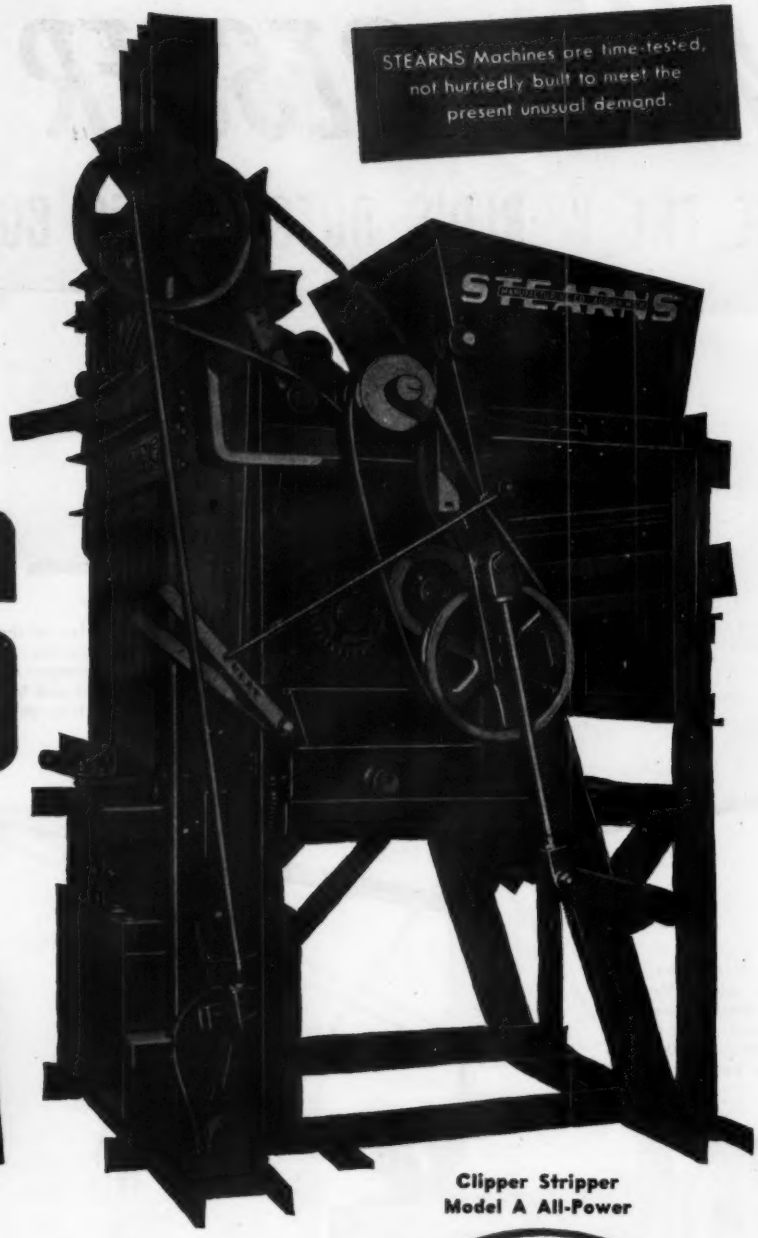
F. C. GEORGE MACHINE CO.

100 S. WESTMORELAND DRIVE

ORLANDO, FLORIDA

STEARNS Machines are time-tested, not hurriedly built to meet the present unusual demand.

MORE BLOCKS per man - per day



Clipper Stripper
Model A All-Power

–that's the record of STEARNS CLIPPER STRIPPERS

- **240 blocks per hour:** That's the number of perfect 8x8x16-in. blocks a Stearns Clipper Stripper Model A (illustrated here) will produce. No other tamp-type machine with comparable power operation can equal that record.
- **Four models,** each with 8-bar tampers and ranging from manual feeding and stripping to all-power.
- **Adaptability:** Starting with Model E (100 b.p.h.), you can, **without sacrifice,** make progressive additions of power equipment until you have all-power Model A.
- **Competition cannot equal** the outstanding advantages included in Stearns Clippers: low first cost, low production cost, low maintenance, adaptability, simplicity.

Performance
Speaks Louder than Words
(ASK ANY STEARNS OWNER)

A Few of Hundreds:

LARSEN BROS. SAND & GRAVEL CO., Rockford, Ill.
Two Clipper Strippers

LEASIDE BLOCK & TILE CO. LTD.
Toronto, Ont., Canada
Two Clipper Strippers

FRANK GOOD
Chalfont, Pa.
One Clipper Stripper

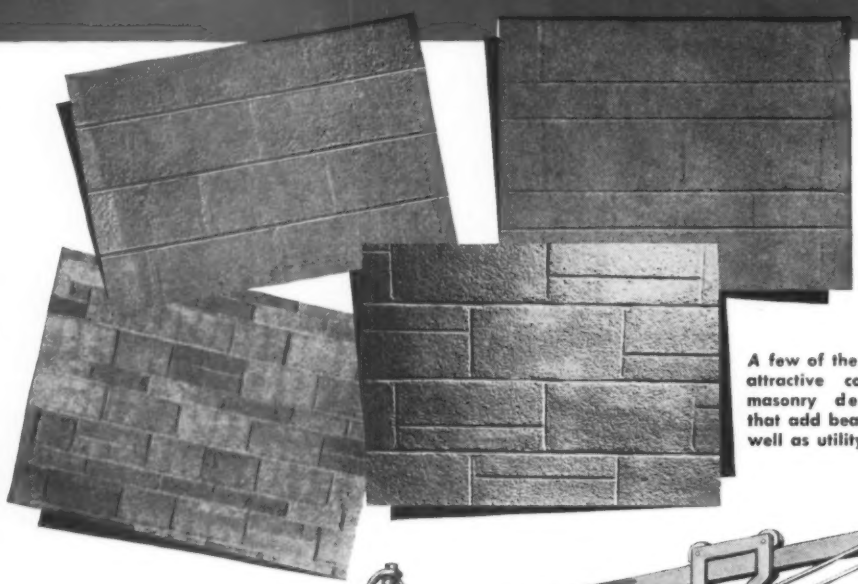
Write today for Clipper Stripper folder describing all four models and attachments

STEARNS
GENE OLSEN, PRESIDENT

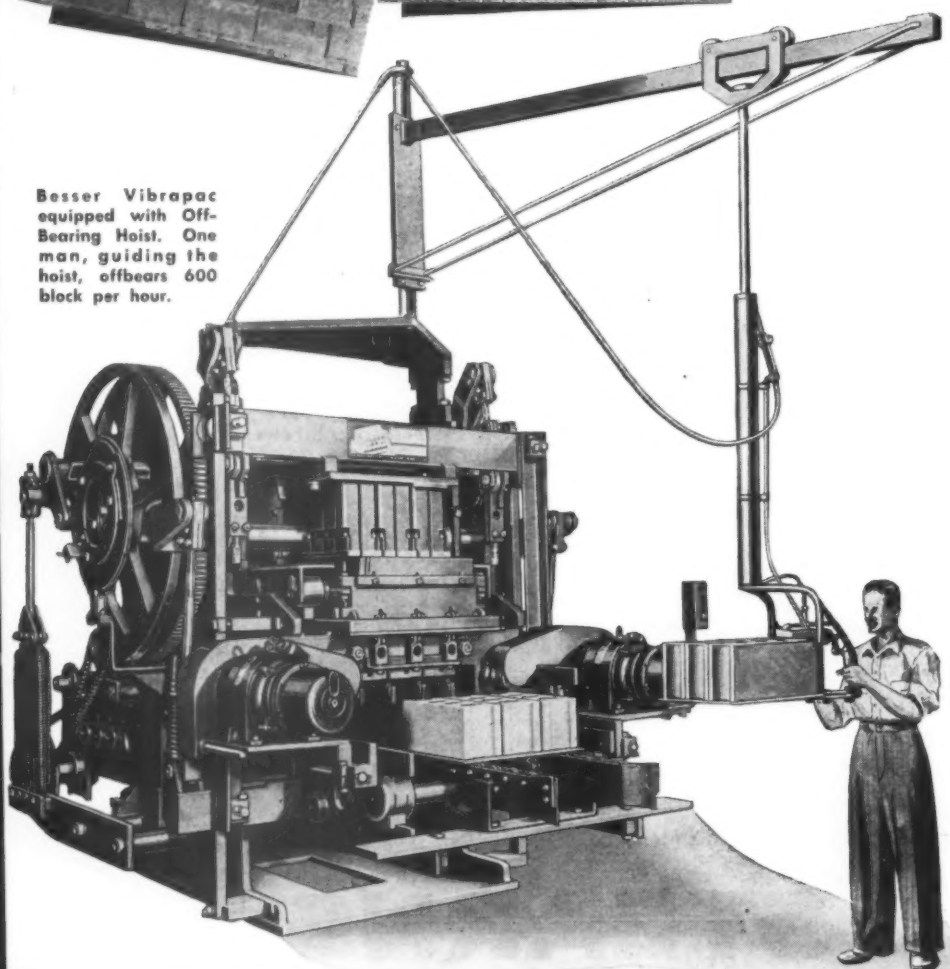
Designers and manufacturers of Concrete Products Plant Machinery: Vibration and Tamp-Type Blockmakers • Mixers • Skip Loaders • Yardhoists

Why BESSER VIBRAPACS-

ARE THE WORLD'S OUTSTANDING CONCRETE BLOCK MACHINES



A few of the many attractive concrete masonry designs that add beauty as well as utility.



Besser Vibrapac equipped with Off-Bearing Hoist. One man, guiding the hoist, offbears 600 block per hour.

The BESSER VIBRAPAC HAS...

- A background of 42 years' experience in the development of better concrete block machines every year.
- The advantages of the original Besser principle of making all sizes and types of units on One Set of Plain Pallets.
- Fully Automatic Operation including Pallet Feeding and Front Delivery of block for offbearing, made possible by the use of Plain Pallets.
- Automatically controlled pressure and Stripper Head which governs the accuracy and perfection of unit dimensions.
- The advantage of Undirectional Vibration which makes possible the control of density and texture to meet requirements of insulation against moisture, sound penetration and for acoustical correction.
- A proved reputation for low-cost production.
- A proved reputation for durability and long years of satisfactory service.
- A record of outstanding service in the production of concrete masonry units for wartime government building construction.
- The flexibility required to make—easily and economically—the variety of unit sizes and types which architects and builders must have for greater beauty and variety of structural design.

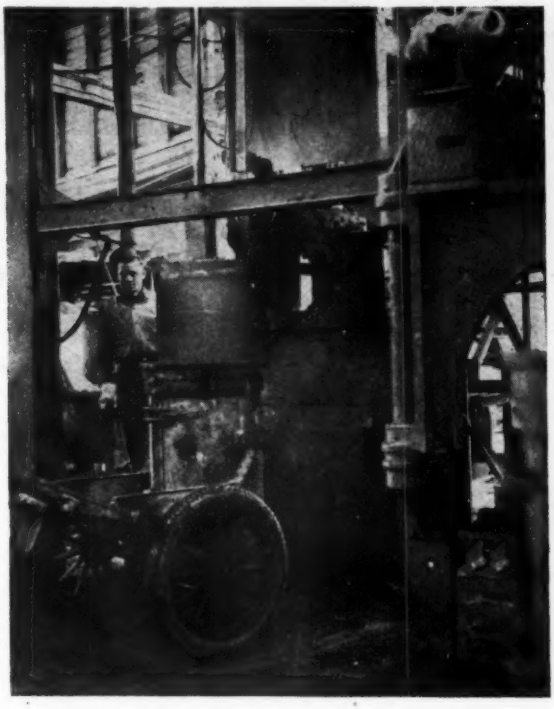
Besser Manufacturing Company provides an experienced engineering staff for special service in the *design of new, or improvement of existing,* concrete products plants.

BESSER MFG. COMPANY

205 46th Street • Alpena, Michigan

Pipe Plant Adds Blocks To Balance Production

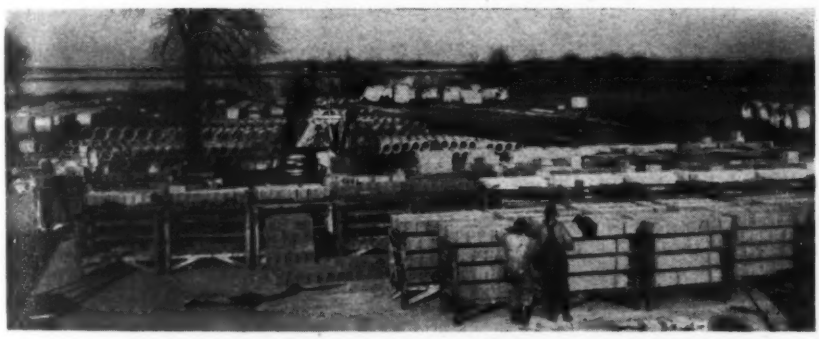
Universal Concrete Pipe Co., Decatur, Ala., develops side line into large volume business



Pipe are moved to curing rooms with rubber-tired buggies

DURING the war years, when construction was almost entirely limited to Federal jobs, production at concrete pipe plants was necessarily curtailed unless the plants provided pipe for Government projects. Although some plants were built primarily to serve these projects, production was cut down when the projects were completed. Such was the case at the Universal Concrete Pipe Co. plant at Decatur, Ala., constructed in 1942 to provide pipe for the Courtland Air Base and the Redstone Arsenal. During the two years required to complete these jobs, about a half million dollars worth of pipe was provided.

With the completion of the Government work, it became necessary to find some means of production to fill the gap created by the cessation of demand for pipe. A block machine was installed, and manufacture of concrete masonry units was started in 1943 to augment pipe production, which still continued although at a slower rate. While this was undertaken as a temporary stop-gap until pipe production was returned to normal, the business that has been built up during the past two years warrants the continuation of block manufacture as a side line.



Pipe are stored on a five-acre tract while block are stockpiled on a concrete-paved area

Left to right: Herman Lawrence, assistant superintendent; George D. Sims, manager; and Bruce Buck, superintendent

Step Up Block Production

In the Spring of 1944, an Appley block machine was installed which gave a daily production of 500 standard 8- x 8- x 16-in. units. In September of the same year another Appley was installed to help meet the increasing demand for block. Production mounted to 1200 units per day. In January, 1945, the two Appleys were transferred to other Universal plants and a Stearns Clipper was installed, stepping up the daily output to about 2000 units. Another Clipper was added in July, 1945, making the production figure rise to 4000 units per day. The final installation was made in October, 1945, when a No. 9 Stearns Joltcrete replaced the two Clippers which were transferred to other plants. Present daily production is about 4500 standard units.

While block manufacture has proven to be an ideal means of taking up the slack in pipe production, it did not become a case of "the tail wagging the dog," since the primary consideration at this plant is the production of concrete pipe. The coming construction season, which will be a large one in Alabama, will place emphasis on the manufacture of pipe, although block will still be produced in large volume.

Merchandising Campaign

An extensive merchandising campaign was instituted in 1943, to pro-

(Continued on page 135)

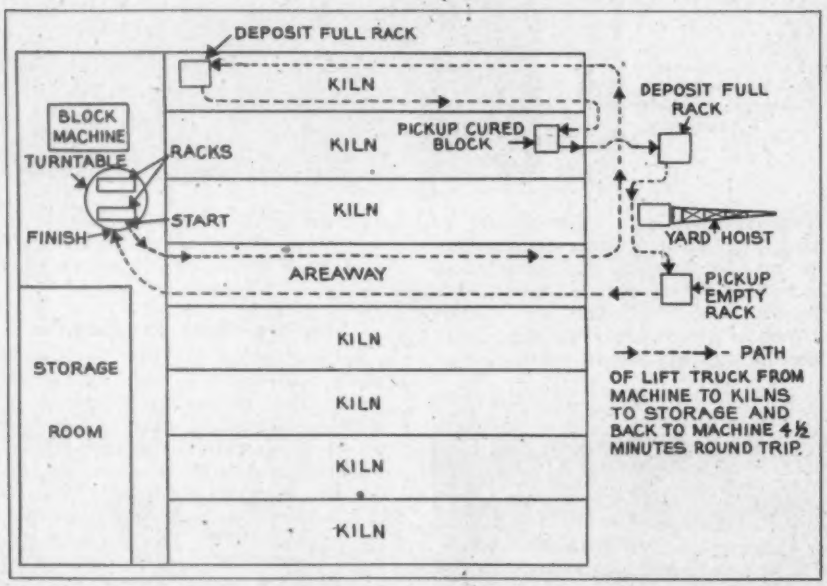
Curing

Change Curing Room Layout to Speed Up Handling

Southern Cast Stone Co., Knoxville, Tenn., also installs new system of transporting aggregates to plant

By H. E. SWANSON

IMPROVEMENTS made during the past six months at the Southern Cast Stone Co., Knoxville, Tenn., have effected savings in time and manpower, and have demonstrated that efficient operation can be attained by careful planning. The changes include a belt conveyor system for moving aggregates to the plant from railroad cars, and a new curing room arrangement.



Layout of plant showing efficient method of handling block from machine to curing rooms and yard, and return of empty racks to the machine

Block are transported from block machine to curing rooms, and then to storage by lift truck

Cars dump aggregate in hopper in foreground for handling by belt conveyor to the plant. Crushing operations are carried on outside the main plant, the bucket elevator carrying the crusher product into the plant

Prior to July, 1945, cinder and Superock aggregates received by rail were manually loaded to skips and taken to the plant by truck. Superock was dumped into a pit from which a bucket elevator carried it up into bins. Cinders were deposited in another pit for movement by a second bucket elevator to screening and crushing operations before introduction to the pit from which they were taken to the plant. This necessitated the use of three men for unloading and one truck driver. Scarcity of manpower and the need for more rapid handling of aggregates to the plant were the prime reasons for the installation of a 6-cu. yd. undertrack hopper and two belt conveyors.

New Conveyor System

Aggregates dumped into the hopper are gravity-fed to a 16-in. Pioneer belt conveyor, 73-ft. centers, for movement to the main pit or to another belt conveyor. When Superock is carried by the conveyor, it is sent directly to the main pit, since it is already sized and needs no further processing before storage. When cinders are moved up the belt conveyor, a baffle plate, placed at the discharge end of the first conveyor, diverts cinders to a 16-in. Pioneer belt conveyor, 20-ft. centers, for transport to the screening and crushing equipment. Throughs from the screen drop into the main pit, while oversize is crushed before being sent to the pit.

Speed Up Block Handling

Last December, the method of moving block to curing rooms and to the storage yard was changed, which not only saved the use of two men but also speeded up movement and allowed a longer curing period. Before the change was made, racks were moved from the machine by manual lift trucks directly into the rooms through entrances opening into the plant. Cured block in racks were removed to the storage area by a homemade power lift truck where they were placed in storage by the Stearns-Warren yard hoist, developed by Millard R. Warren, general superintendent of the plant.

The procedure now employed allows one man to move block to curing rooms and to storage, and then return empty racks back to the machine. Entrances to the rooms from the inside were closed off, and a turntable was installed at the machine. This turntable, 9 ft. in diameter, allows room for two racks. When one rack is filled, the turntable is revolved until the empty rack is in position for the operator, while the filled rack is ready to be moved by a Hyster QT 20 lift truck. The operator of the lift truck moves the filled rack into an empty room, leaving the plant through an areaway provided by elimination of one curing room.

As shown in the sketch, the lift truck goes through this areaway and enters the curing room from a point outside the plant. The operator then goes into a curing room filled with finished units and moves a loaded rack to the storage yard, places it on one side of the yard hoist, and takes the empty rack from the other side of the hoist back to the block machine. The round trip takes about 4½ minutes, which is the time that it takes to produce a rack of 60 standard block. The entire job of moving block and racks, and of storage, is accomplished by two men; one to operate the lift truck and one in the yard to unload the units.

Block now receive a longer period of curing, since the racks stay in the kilns until removed by the lift truck. Prior to this method, a room was emptied the first thing in the morning before newly made block could be placed in the room. Better curing is also attained since, with only one opening, less draft to dissipate the steam is allowed in the rooms. There are seven kilns, with one left empty to receive the block made at the start of operations. Capacity of the remaining six rooms, adequate to handle production, is 7380 standard 8- x 8- x 16-in. units.

Operating on two 10-hour shifts, average production capacity of 7000 units per shift is possible. The two-shift operation has been made feasible by the saving in critical manpower effected by the new changes. A complete story on this plant appeared in ROCK PRODUCTS, June, 1945, page 125.

Aggregates carried by belt conveyor, to the right, from under-track hopper discharge to the belt conveyor, on the left, for transfer to crushing equipment, or to pit below for handling to main plant by bucket elevator. A baffle plate diverts flow to second conveyor when aggregates are to be crushed

New Block Plants

CONCRETE PRODUCTS CO., Columbia, S. C., located on Pinehurst Road, one block north of Forest Drive, has started production. Emmette Groover is the owner. James O. Love and Woodrow Pedersen will manage the plant.

CONCRETE PRODUCTS CO., Brunswick, Ga., is the name of a new concern which is a subsidiary of the Brunswick Marine Construction Co. According to the announcement, the plant will manufacture "cement-base building materials." Between 80 and 100 persons will be employed.

ACME CONCRETE BLOCK CORPORATION, Hendersonville, N. C., plans to start operation April 1. Alex J. Duris, Joe W. Anders, George Klick and Austin K. Cleveland are interested in the company. Mr. Duris is a building engineer, recently discharged from the armed services; Mr. Klick was formerly engaged in the construction business at Fort Lauderdale, Mr. Anders is a local contractor, and Mr. Cleveland is a Florida resident, but plans to become active in the business.

CLINTON CONSTRUCTION CO., Wilmington, Ohio, referred to in the March issue of ROCK PRODUCTS, as a new $150,000 concrete block and ready mixed concrete business, is owned by C. C. Beam, Harry H. Brandon, and Ronald A. Gordon, who are widely known in the aggregates business.

FREEMAN CONCRETE PRODUCTS CO., Snohomish, Wash., has started the production of sand and gravel concrete block and pumice concrete block. Freeman Lancaster is the owner.

MIDLAND MATERIALS, INC., Fredonia, Kans., is a new concern which will manufacture concrete block and pipe on the site of the former Fredonia Brick Co. Brian O'Brian is general manager.

W. G. STANTON plans to start the manufacture of mortarless, interlocking concrete block and garden specialties at Salem, Ore.

THE DE SMET CEMENT PRODUCTS CO. has started operations in De Smet, S. Dak.

BOSTONIA CEMENT BRICK CO., Lakeside, Calif., started operations. I. C. Cooper and son, Burell, are owners and operators of the plant.

B. AND B. BUILDERS SUPPLY CO., located on North Palafox highway at Goulding, Fla., near Pensacola, is now producing 2500 concrete block per day. R. D. Bonham and E. S. Boone are owners.

DEWEY SPEAKMAN and son, George, have opened a concrete block plant at Circleville, Ohio. Two tamping machines are operated.

CARL S. SCONYER, a returned overseas veteran, will open a concrete block plant in Sycamore, Ga.

LYNDEN BUILDING MATERIAL CO., Lynden, Wash., is the name of a new concrete block manufacturing company organized by William Zuidmeer and Bert Rutgers. A pumice aggregate block will be made.

FALLON CONCRETE PRODUCTS CO., Fallon, Nev., has been oganized by E. D. Frazzini and Newt Lumos. Mortarless block will be made, and also concrete pipe.

DOTEN'S TRANSIT MIX, Spokane, Wash., has been started by Robert Doten. Both concrete block and ready mixed concrete will be produced.

WILLIAM OAKLEAF plans to start a concrete block plant at Willmar, Minn.

Round-Table Discussion Features Pipe Convention

American Concrete Pipe Association annual convention program covers operating practices, reinforcing, air-entraining cement and OPA regulations

By M. W. LOVING*

MANUFACTURERS of concrete pipe from all over the United States and from one province of Canada, attended the American Concrete Pipe Association convention in Chicago on April 11, 12, 1946. More than one hundred concrete pipe manufacturers attended this meeting which is an all time record. This was the first convention since the war; the last was held at the Drake Hotel, Chicago, in February, 1944, when the Association was reorganized to function as a trade association to deal with and solve the many problems facing the industry in the post-war period.

Several meetings of the Board of Directors were held on April 9 and 10 and a planned program was prepared, presented and adopted at the business session on April 11. All the sessions were well attended and the Program Committee, E. H. Fox, the new secretary and H. F. Peckworth, managing director, did an excellent job in this direction. The "Pipe Follies Bergeres," following the annual banquet Friday evening, with an attendance of one-hundred-eighty-seven members and their ladies was really outstanding. A fitting climax to such a successful meeting.

The business session, Thursday morning, April 11, opened with an address by President O. H. Miller, the report of the managing director, secretary, treasurer and consulting engineer. As previously stated, the program for activities in 1946, and until the next convention, was approved by those in attendance. This session was carried over in a discussion of old and new business in the afternoon and was followed by a "Jam Session" at which E. H. Fox presided. A panel of concrete pipe experts was set up to answer many questions pertaining to the manufacture of concrete pipe and this was a lively session. Even the most experienced manufacturers have different ideas about how to do the same things. Like all sessions of the convention, this was well attended and everyone took an active part in the discussion. A movie showing modern methods of manufacturing and handling pipe, to minimize labor costs, was shown at this session.

*"Mike" Loving assumes all legal responsibility for the statements in this article and the captions under the illustrations which he took at the convention.

Mrs. George B. Denham, Hattiesburg, Miss.; Mr. Denham; C. J. Kelly, New Orleans, La.; Mr. and Mrs. Becker, New Orleans, La.; Mrs. R. L. Menuet and Mr. R. L. Menuet, Alexandria, La.

H. Xavier Eschenbrenner, trying to sell the charming musician a concrete pipe machine

President Miller invited all those in attendance to an informal reception in his suite in the early evening of February 11. Naturally this was well attended and later a dinner, intended for the Board of Directors, was held in the Berwyn Room. As it urned out, many of the members and their ladies attended this novel dinner.

The stars of the evening in entertainment were R. M. La Due, Concrete Pipe Machinery Company, Sioux City, Iowa, E. H. Fox, and Jack Shea, president, Gulf Concrete Pipe Company, Houston, Texas.

The morning session, April 12, addressed by T. J. Kauer, Managing Director, Wire Reinforcement Institute, Washington, D. C., on the subject Possible Standardization of Welded Wire Reinforcement. Mr. Kauer was Washington representative and later Assistant Managing Director of the Association at Washington, D. C., from 1938 until he assumed his new position in October, 1945. Before and during the war, he did an excellent job for the Association and the industry in handling the many difficult problems of the time. G. L. Rounds, Director of Engineering Division, Bureau of Community Facilities, Federal Works Agency, Washington, D. C., addressed the session on Outlook for Public Works in Post War Period. George A. Mansfield, Technical Service Director, Huron Portland Cement Company, Detroit, Michigan, addressed the session on Air Entraining Cement, as it applies to the manufacture of concrete pipe. Following this address, Secretary J. D. Mollendorf, president, Illionis-Wisconsin Concrete Pipe Co., Chicago, Ill., read the report of the tellers who had canvassed the secret ballots for officers and directors that were collected from the members at the opening of this session.

New Officers

President Miller passed the gavel to the new President, Elmer L. Johnson, general manager, Concrete Conduit Company, Colton, Calif. The

afternoon session, April 12, was addressed by Fred D. Bowlus, office engineer, County Sanitation Districts of Los Angeles County, Los Angeles, Calif., on the subject, "Design of Sewage Flow to Eliminate Apparent Sulphide Generation." This was followed by an address by Julian W. McClamroch, Head, Cement and Concrete Products Unit, O.P.A., Washington, D. C., who answered many questions concerning O.P.A. regulations. At 6:30 p.m. a reception was held in the West Lounge. This was followed by the annual banquet in the Michigan Room, which was an outstanding occasion.

The Editor of ROCK PRODUCTS asked me to report this meeting and intimated that his readers would be more interested in an account and pictures of some of the people who attended the convention than an abstract of the proceedings. I will therefore devote the rest of my allotted space to men in whom I know you will be interested.

C. H. Bullen, Chicago (peeping around the lady's hat); E. P. Evans, Green Bay, Wis.; Mrs. Bullen; Gordon Burk and Mrs. Burk

Convention Personalities

O. H. MILLER, Choctaw, Incorporated, Memphis, Tenn., the retiring president, was elected president and acting managing director, at the February, 1944, Convention, previously mentioned. He also served as chairman of the Executive Committee. This was a strenuous job, and in my opinion the American Concrete Pipe Association and the industry owes a debt of gratitude to Mr. Miller for his untiring efforts in this direction. But at the same time, he owes a lot to the concrete pipe industry because he has made a lot of money in the manufacture and sale of concrete pipe. For many years he struggled along, hopelessly, in the manufacture and sale of corrugated metal pipe and in the course of events, when the manufacturers of concrete pipe began to close in on him for the kill, he decided that it was expedient to buy a concrete pipe plant and get into the business in Memphis, Tenn., but being a shrewd business man, he was very wise indeed in securing the services of E. Frederick Bespalow, one of the outstanding engineers and concrete pipe manufacturers in this country. Mr. Bespalow, under Mr. Miller's guidance, made an outstanding success in his end of the company's affairs. O. H. knows how to pick the right men for any job and he is a fine fellow to work with and for, and all his men are loyal to him. He was elected a Director to serve until 1948.

R. A. Foley and J. W. Porter, Dallas, Texas

ELMER L. JOHNSON, Concrete Conduit Co., Colton, Calif., as previously stated, was elected president of the Association for 1946. Elmer is one of those rare combinations, an excellent civil engineer and a shrewd and successful business man. He migrated from Montana to southern California about 15 years ago, and became associated with a mechanical engineer who had recently designed a new centrifugal machine to produce reinforced concrete pipe. Operating in one of the most highly competitive trade areas of this country, Mr. Johnson has made an outstanding success in the manufacture, sale and installation of concrete pipe for water supply, sewers and sewage force mains, culverts for railroads and highways and irrigation systems. All the concrete pipe produced by his company is of excellent quality and the efficient innovations he has devised for production, at minimum cost, are a revelation to anyone interested and engaged in this business. One lady in his office spends all her time keeping up all Elmer's production and sales charts, each day, week and month of the year. At a glance, Mr. Johnson knows all the ins and outs of his plants at Colton, Calif., and Phoenix, Ariz. His loyal organization functions like clock work. He worries less about

From California: Sitting, E. L. Johnson, Colton, the new president, and G. D. Williamson, Yuba City (he hunted Kodiak bears in Alaska with me in 1941). Standing, D. A. Dunkle, Los Angeles; H. W. Chutter (pronounced Chudder), Fresno; and H. A. Weigand, Oakland

President O. H. Miller, with that typical angelic expression

Mayor O. H. (Slim) Price, Healdsburg, Calif.; F. J. Colosey, H. O. Davis, Philadelphia, Penn.

Sis Eschenbrenner, a handsome friend on her right and her daughter on her left

G. E. Bing, Cleveland, Ohio; Elmer Leullette, New York, N. Y.; T. J. Shiverton, San Antonio

W. B. (Wild Bill) Freeman, Denver Colo.; Mrs. W. H. Price, Healdsburg, Calif.; Mr. "Chudder"; Mrs. G. R. Jessen, Salt Lake City, Utah; George (Bull) Jessen

his business than anyone I know and he will serve the Association well in the times ahead.

H. ESCHENBRENNER, Universal Concrete Pipe Co., Columbus, Ohio, was elected first vice-president. "Hec" organized his company and built his first concrete pipe plant at New Martinsville, W. Va., in 1920, soon after he got out of the Army. By 1942 he did not know, himself, how many plants he had. They were scattered from New York to Texas and from Ohio to Florida. No one engaged in the concrete pipe business has been feared, cussed and liked more than Hec. But he has what it takes and is concrete minded to the nth degree; members of his organization are very loyal to him and for that principal reason, his company has been an outstanding success. By 1942 his company was one of the two largest in the United States. When he was injured as a boy, in a street car accident, he said that he would have to make his living with his head rather than with his hands. He has often told me, and others, that had it not been for this accident, he would not have accomplished what he has, over the years. He is a strong believer, even in these times, in opportunities for everyone, especially young men, in this country. He spent his early childhood in Belgium and came to this country as a youngster and soon got busy making his way. He is a fluent speaker on almost any subject and enjoys meeting and association with people in all walks of life. But back of "Hec," for more than 25 years, is a very strong, guiding influence—his wife Sis—one of the most charming and loyal ladies I have ever known. "Hec" will serve the Association well.

M. C. KELLY, Great Lakes Concrete Pipe Co., Buffalo, New York, was elected second vice-president. "Mel," a redheaded Canadian, came to this country about 15 years ago, and he became an American citizen when I signed his naturalization papers. He has done a wonderful job in Buffalo and the State of New York, in producing and advocating the manufacture and sale of concrete pipe of standard quality. In 1924, concrete pipe, especially that used for highway culverts, had a bad reputation, because it was often improperly made. But today it is considered the best material for building drainage structures for highways and railroads, sewers, drains, et cetera, by the engineers of the State of New York. "Mel" is the kind of man the Association needs, and is fortunate to get, to advance its interests from now on.

GEORGE B. DENHAM, Faulkner Concrete Pipe Co., Hattiesburg, Miss., was elected third vice-president. George has been engaged in the sale and manufacture of concrete pipe of standard quality for more than 20 years. Most of the cities in his sales territory use concrete pipe for the construction of sewers, drains, and reinforced concrete pipe is extensively used by the State Highway Department and Counties for the construction of culverts. During World War II, there was a vast amount of defense work in that section and the boys did a land-office business because most of these projects became a network of concrete pipe. George is a quiet, nice, friendly fellow and is highly respected by his friends and his competitors.

E. H. FOX, Cincinnati Concrete Pipe Co., Cincinnati, Ohio, was elected secretary of the Association. As chairman of the Program Committee and aided by Mr. Peckworth, he arranged an outstanding meeting, especially the entertainment for the annual banquet, Friday evening. One of his competitors told his subordinates, in my presence, that they should go to Cincinnati to see how concrete pipe of excellent quality and appearance should be and was being manufactured.

H. F. PECKWORTH, Chicago, Ill., was reappointed managing director of the Association for 1946. For many years before he was employed by the Association, in April, 1945, Howard was on the staff of the American Society of Civil Engineers, New York, N. Y., and traveled extensively on Society business. He knows most of the city and consulting engineers, state highway and government engineers in this country. Everyone speaks well of him and he is one of those fortunate individuals with few or no enemies. He likes everybody, even me. He can and will conduct the affairs of the Association in a very able manner. He has plenty of stuff and lots of initiative. But no one man, or group of men, for that matter, can accomplish much in any trade Association without the full and constant support of all members of the industry.

C. H. BULLEN, Midwest Concrete Pipe Co., Chicago, Ill., was drafted again as treasurer. One of the pioneers of the industry, Mr. Bullen was the first man to produce concrete pipe by the machine tamped process, made with dense and impermeable concrete, at Portland, Ore., in 1910. He invented what is known today as the "elevated pallet," which made possible the removal of forms without injuring the pipe when semi-dry concrete mixtures were employed. In 1911 he produced 18-in. concrete sewer pipe with a 1¾-in. shell thickness which withstood, without leakage, an internal hydrostatic pressure of 50 p.s.i. If you want to see what that means, try the same experiment on some of the pipe you are manufacturing in 1946. He made an outstanding success in the concrete pipe business in the Pacific northwest

until 1926, when we brought him to Chicago to show the local lads how it could be done here. He showed 'em.

JOHN B. JARDINE, Concrete Sectional Culvert Co., Fargo, N. Dak., was selected a Director to serve until 1948. He is carrying on the business founded by his father many years ago, in the great open spaces of North Dakota.

E. E. BRAINARD, Lock Joint Pipe Co., East Orange, N. J., who served as third vice-president from 1944 to 1946, was elected a Director to serve until 1948. Mr. Brainard, together with R. A. Foley, Gifford-Hill Pipe Company, Dallas, Texas, E. H. Fox, H. Eschenbrenner and G. H. Redding, president, Massey Concrete Products Co., Chicago, drafted the new Constitution and By-Laws on which the reorganization of the Association, in 1944, is based.

D. A. DUNKLE, American Pipe and Construction Company, of Los Angeles, Calif., was elected a Director until 1949. Dud is a quiet, reserved young fellow, with plenty on the ball. His work in the pipe business has been largely in the pressure pipe field and it is said he spent several years, in the interests of his company, in South America. How much pipe he made and sold or what else he did down there I never knew, but he came back with a naughty little twinkle in his eye.

H. H. DICKEHUT, Austin Concrete Works, Inc., Austin, Texas (where I was born 55 years ago), was elected a Director until 1949. Mr. Dickehut, like Mr. Fox of Cincinnati, makes the kind of pipe you hear about at conventions. When an engineer visits his plant in Austin, he is very favorably impressed and becomes a booster for concrete pipe, especially when and if he tests it or uses the records of the Texas State Highway Department or other political subdivisions. Each unit is a work of art.

G. R. JESSEN, Utah Concrete Pipe Co., Salt Lake City, Utah, was elected a Director until 1949. In the comparatively short time, by my standards, he has been engaged in this industry, George has made a phenomenal record. Before he lit in the Salt Lake Basin, the clay pipe and corrugated metal pipe interests had things their way. George went to work and the reverse is true today. At his plants at Salt Lake City, Provo, Ogden and Brigham City, you will see the kind of pipe you read about. Besides manufacturing machine tamped pipe for sewers, culverts, and irrigation, he produces centrifugal pipe for water supply and concrete building blocks, on an enormous scale. Naturally, the defense projects in that area during the war didn't harm his business. George is now branching out into the cattle business and on his not infrequent trips to Chicago, he seems to be more interested in bulls than concrete pipe.

T. A. Polansky, Houston, Texas; H. H. Dickehut, Austin, Texas; R. S. Lander, Little Rock, Ark.; his daughter; Mrs. Lander; Jack Shea, Houston, Texas, and L. F. Dolch, Dallas, Texas

J. CALVIN HELMS, Helms Concrete Pipe Co., Alexandria, Va., was elected a director to succeed H. A. Weigand, Oakland, Calif. (who resigned because Elmer Johnson wisely drafted him as a member of his organization to manage a new plant at Oakland).

Jay Helms and Henry Weigand are just alike. They are both excellent concrete pipe men but both are more interested in dogs. Jay favors hunting dogs but Henry specializes in racing dogs.

Space does not permit me to continue this account of interesting folks in this industry and I will conclude with this observation: The future holds great and promising prospects for concrete pipe of all kinds. Much progress obviously has been made in the past thirty years in which I have been privileged to serve the industry. New developments are in store and it is my conviction that the industry will progress on an enormous scale.

From New England: J. A. Dunn, Swampscott, Mass.; T. B. Rutherford, Newton, Mass.; W. E. (Jim) Corbett, Milford, Mass.; Henry Eames and F. A. Trautner, Newton Upper Falls, Mass.

G. H. Redding, Chicago, Ill.; H. F. Peckworth, Chicago, Ill.; Mrs. Peckworth, and R. W. Mitchell, Montreal, P. Q., Canada

KENT tamper & stripper

with off-bearer attached to frame. This is an efficient, longer lasting machine. Produces strong, beautiful block.

THE KENT DUNKER
Pallet Cleaner and Oiler

This patented Dunker keeps pallets in prime condition at all times. Just hang the pallets on the pins and as they are taken off for use the spider rotates by gravity passing the pallets through the tank. You can use discarded crank case oil from your trucks in the Dunker tank.

The KENT MACHINE CO.

Cuyahoga Falls, Ohio

Wisconsin Block Producers Meet In Milwaukee

INFORMATIVE addresses provoked lively discussion at the 26th annual meeting of the Wisconsin Concrete Products Association, held at the Ambassador Hotel in Milwaukee on Tuesday, April 9, 1946. There was an attendance of 78 members and friends.

HERBERT LOUCKS, Madison Silo Co., Madison, Wis., president of the Association, presided at the morning session, which started with a short business meeting. Mr. Loucks said in his welcome address that the Association must work harder than ever this year to assist the many newcomers in the concrete products field. The following were elected to the Board of Directors: George P. Andrew, Fond du Lac Concrete Products Co.; Arthur Devos, Devos Block Co.; Otto Ladwig, Otto Ladwig and Sons; Herbert Loucks; Wm. P. Siegert, Economy Block Co.; Wm. Schneider, Best Block Co.; Elmer Strong, Strong Concrete Block Co.; Harry Sorenson, Waylite Concrete Masonry Co.; and Arthur Grubbe, Sheyboygan Brick Co.

Modular Sizes Coming

E. W. DIENHART, executive secretary, National Concrete Masonry Association, spoke on "Modular Sizes for Concrete Masonry Units." He stated that for practical promotion of the concrete unit, the length, width and height should be standardized. He stated that the Producer's Council and the American Institute of Architects are pressing the issue for a modular size, and that the Structural Clay Products Institute has taken an aggressive stand and has put on a promotion compaign to get the brick producers to go to modular sizes. "We should go along in the national movement for standardization of units," said Mr. Dienhart. He showed a chart divided into modules of 4-in., for working out the size of units, together with mortar joints. Although the unit plus the mortar joint should work out in modules of 4-in., the face-shell thickness must remain the same, that is, the pallets cannot just be ground down arbitrarily, but the entire unit should be made smaller, with the same face-shell thickness.

WM. SIEGERT, Economy Block Co., Wauwatosa, presided at the afternoon session and announced the following new officers: George P. Andrew, president; Wm. Siegert, vice-president; Lester Grubbe, 2nd vice-president; and Arthur Devos, re-elected secretary.

Curing Developments

BENJAMIN WILK, Standard Building Products Co., Detroit, Mich., spoke on "Recent Developments in Curing Concrete Block." He told about tests that were made in the 1920's that showed that block cured more quickly at higher temperatures than at lower temperatures. For example, block tested after two days curing at 70 deg., were found to have 30 percent of their full strength, while block cured for two days at 150 deg. had 80 percent of their total strength. He then told of the tests made in conjunction with the Portland Cement Association at the Cleveland Builder's Supply Co. plant at Cleveland, and at the plant of Plasticrete Corp., Hamden, Conn. These tests were made to determine the results when units were cured at 130 deg. as compared to those cured at 200 deg. He said that there was no appreciable difference in the compressive strengths of the units cured under the two temperatures.

Mr. Wilk also discussed curing rooms, and stated that the best insulation on the market was a foam glass, which will not absorb water

(Continued on page 138)

Left to right: Bruce Gorni, Advance Cast Stone Co.; E. W. Dienhart, executive secretary, National Concrete Masonry Association; and Wm. Schneider, Best Block Co.

Diversify

(Continued from page 127)

mote the sale of pipe to other than Government agencies. Advertisements were placed in local papers, spot announcements were made on the local radio station, and a salesman was sent into the field to contact individuals and county and city officials in 15 northern Alabama counties and six southern Tennessee counties. Through this program, a normal pipe business has been built up, and repeat orders have been received from counties, municipalities, and the State Highway Department.

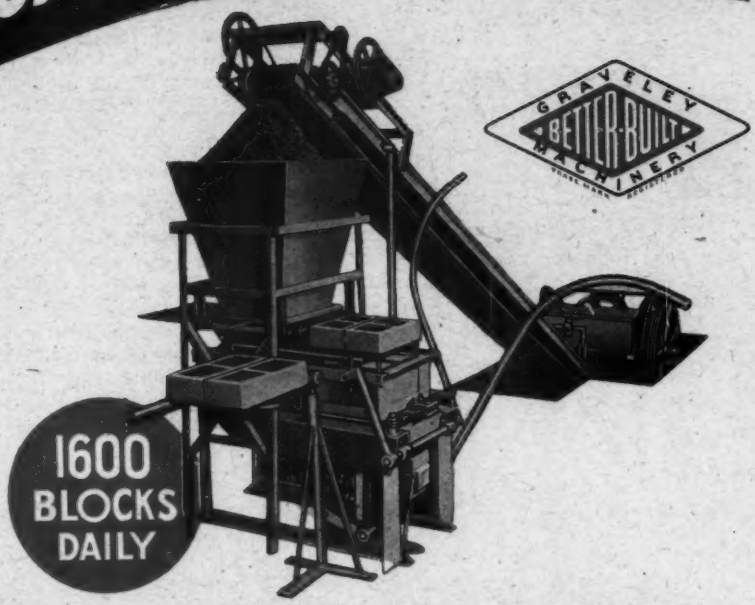
Present demands are handled by a Universal tamper, which makes pipe from 6- through 60-in., although during the period when the Government projects were supplied, an additional Universal tamper was used to make sizes from 60- through 72-in. Larger sizes are cast, usually from 84- through 92-in. Should the market this year live up to expectations, another machine likely will be added. The present tamper, which operates at 680 strokes per minute, makes a 24-in. pipe in about three minutes and a 30-in. pipe in about five minutes.

Aggregates for both types of manufacture are crushed limestone and washed river-run sand and gravel. Aggregates for block are sized from ⅝-in. and down, while aggregates for pipe vary according to the size of pipe to be made. For example, a 72-in. pipe will take an aggregate from ⅝- to 1½-in. gradation. Both normal portland cement and high early strength cement are used in pipe manufacture, while air-entraining cement is used for block. It has been found that this type of cement produces a concrete that is more workable, more plastic, and yields a block that will break less readily during handling.

Curing Rooms Serve Both Pipe and Block

Pipe are moved to curing rooms by rubber-tired, off-bearing lift buggies, while block are moved on racks by Barrett-Cravens lift trucks. The four curing rooms adequately handle the daily production of both block and pipe. Three curing rooms are 140 ft. long and 20 ft. wide, and the fourth is 60 ft. long and 30 ft. wide. All rooms are 15 ft. high, to allow the entrance of a Ford "yard truck" with an "A" frame, which moves pipe to the storage yard. The truck, equipped with a winch, operated by power take-off from the truck motor, lifts the pipe into position for handling to storage. Steam at 50 p.s.i., provided by a 120-hp. horizontal boiler, is piped to the curing rooms through a 2-in. line. This 2-in. line feeds into two 1-in. pipes, set on the floor level, with ⅛-in. perforations spaced every 18 in., to thoroughly saturate and cure the product.

COMPLETE BLOCK PLANTS



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PERFECTION VIBRATION . . . BETTER BUILT blocks are uniform in every respect, are the most satisfactory to the builder because of their density, and are the PERFECT block because of BETTER BUILT VIBRATION. All-way VIBRATION is assured.

DEPENDABILITY . . . Precision designing and rugged construction marks every BETTER BUILT product. They are built to last, and simplicity of design is a large factor in meeting every requirement of concrete block construction. Long time operation with no time out for repairs is a salient feature.

BETTER BUILT MACHINERY is constructed in every instance with the idea of economy of money, time and effort and to meet the needs of skilled builders. Make your plant BETTER BUILT throughout.

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GRAVELEY BETTER-BUILT MACHINERY

Coming . . . Next Month, Golden Anniversary Issue ROCK PRODUCTS 1896 • 1946

ERICKSON POWER LIFT TRUCKS

STAMINA
SPEED
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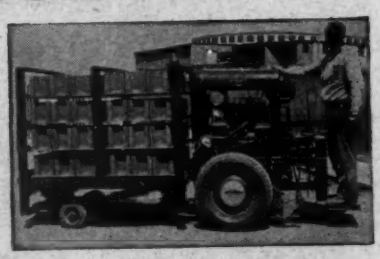

Pneumatic tired, low and high lift fork trucks—platform trucks.

No paved runways needed—Speedy hydraulic platform raiser —Simple controls. Write for complete details.

ERICKSON SPECIAL EQUIPMENT MFG. CO.

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Complete Block Plant Equipment

HENDRY CORPORATION, Rattlesnake, Fla., is manufacturing and distributing complete concrete block plant equipment designed by Frank I. Blatt.

In the accompanying illustrations may be seen the complete plant set-

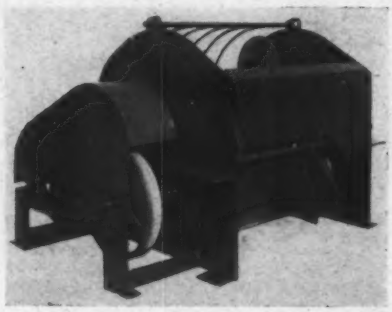
Three-gate concrete hopper to feed three block machines

up, and individual views of the mixer and hopper. While the mixer is similar to those used in most block plants, it is said to be very fast and to use less horsepower. By changing pitch of blades, increasing speed, and designing new style arms, the mixer throws mix from side to side and top to bottom. A 5- or 7½-hp. motor operating at 1700 to 1800 r.p.m., may be used. All bearings are oversize roller and ballbearings, sealed for protection against dust and grit. First reduction of drive is V belt and second and third reductions are roller chain. The mixer will supply sufficient concrete for 4000 blocks daily.

The 12-in. conveyor belt is 20-ft. centers. The conveyor belt hopper fits in a pit directly under discharge opening of mixer, while conveyor discharge rests on adjustable legs, having not over 30 deg. angle of incline. A 1-hp. motor is used. There are three belt cleaners; one idler scraper under the head pulley, one triangular bracket on top of return belt just ahead of tail pulley, and one plate cleaner under return belt, just ahead of tail pulley.

A close check on water supplied mixer is provided by the water control tank. An indicator is moved to the desired position on the gage glass, and the exact quantity of water is introduced into the mixer. Inlet and outlet valves with overflow provides almost an automatic system.

The conveyor dumps concrete to a hopper with three gates so that three small block machines may be operated at the same time. Regulators have been built into this hopper so



Concrete mixer with three-reduction drive for fast operation

as to cut out one or two machines at will or re-regulate flow of material.

The most recent addition is the Kissam-Blatt controlled oscillation block machine designed by Allen Kissam, Orlando, Florida.

Employes Buy Plant

AUBURN CONCRETE PRODUCTS CO., Auburn, Wash., has been sold by C. M. Long to his former employes: Carol Clement, Perry Pearson, William Snodgrass and Harvey O'Brien. Both block and concrete tile have been made.

Palletizing Cement Bags

ALPHA CEMENT CO., Easton, Penn., has aided the U. S. Navy in the development of a method for mechanically handling bags of portland cement by means of palletizing.

Manual handling of the bags from railroad cars to storage depots and ships consumed many man-hours of work and was proving unsatisfactory at the U. S. Navy Advance Base Depot at Davisville, R. I. Then Clyde C. Roth, project manager of the Depot, began a system of stacking the sacks on 4-ft. x 4-ft. x 6-in. pallets, 25 sacks in a load, and handling the stack by means of power trucks. This method not only saved labor, but it made better use of storage space by stacking the pallets higher with the power truck than was possible to stack the bags by hand.

The Alpha Portland Cement Co. offered to further the plan by testing the practicability of shipping packaged cement on pallets by rail. At the company's No. 4 plant at Martins Creek, Penn., pallets were loaded, five bags to a layer and five layers high, then stacked in tiers to fill a railroad car. The car was shipped to the Davisville base where the load was examined and found to have shipped satisfactorily. Success of the method of handling was such that the company decided to palletize the bags at the end of the production line at the mill. Two men guided the bags as they came off the conveyor from the packing machines and placed them on the pallet in a manner so that each layer would help in holding the one below it more securely. A power lift truck then picked up the pallet and loaded it in the box car.

Through this mill palletizing, the operation of unloading was made so much easier that 25 or 30 cars could be handled in the time previously taken to unload one.

New Block Concern

CONCRETE PRODUCTS CO. and AMERICAN RAPID TRANSIT MIX CEMENT CO. expect to start operations in new plants near Clarkston, Wash., along the Snake river water-front. Stanley L. Lafrenz, owner of the ready mix company, will be associated with William Houser in the Concrete Products Co., which will manufacture both pipe and concrete masonry. The ready mixed concrete plant will have a capacity of 400 cu. yd. daily.

Block Plant

MORTARLESS BLOCK CO., Yakima, Wash., is constructing a plant for the production of interlocking concrete block. Capacity of the plant will be 5,000 block a day, according to Alden Flint, manager.

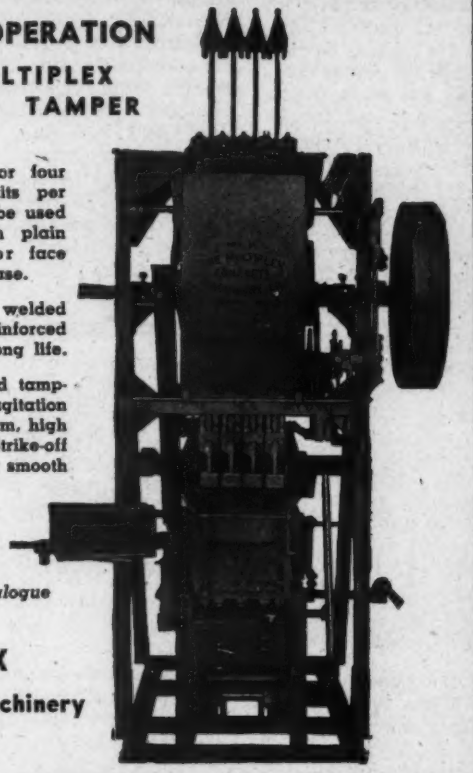
Overall view of plant, showing water control tank, mixer, belt conveyor, three-gate hopper, and block machines

QUALITY BLOCK

LOW COST PRODUCTION

SIMPLE OPERATION

WITH MULTIPLEX STANDARD TAMPER



Produces three or four 8 x 8 x 16 in. units per minute and can be used for making both plain and stripper or face blocks, on one base.

Rugged, all-steel welded frame and reinforced moldbox mean long life.

Time feeding and tamping and hopper agitation result in a uniform, high quality block. Strike-off hopper assures a smooth top.

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Elmore, Ohio

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With **COMMERCIAL**

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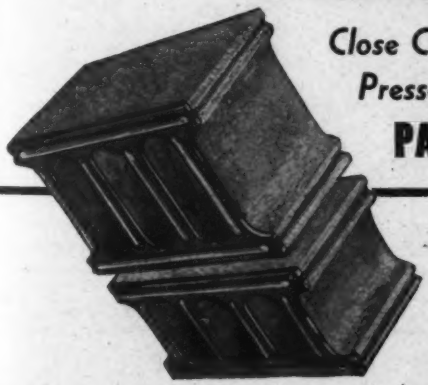

★ Clearance to 1/16 in. of sides of mold box means sharp edges, even with finest aggregates.

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Literature containing helpful suggestions on advantages of concrete for industrial, home and farm improvements and new construction is available on request. Free in United States and Canada.

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★ ★ ★

BUY U. S. SAVINGS BONDS

Milwaukee Meeting

(Continued from page 134)

and will not allow penetration of heat. He also mentioned that some means of introducing dry air into the curing room after the curing period must be devised, so that the moisture in the block can be reduced more rapidly. He said that more will be known about proper curing after the tests by the P.C.A. are completed.

A lively discussion followed Mr. Wilk's talk, during which he pointed out that by introducing steam into the rooms enough moisture must be made available to prevent drawing out moisture in the block, thus allowing the block moisture to hydrate the cement. He said that "for proper curing, there must be high humidity."

P. N. THERN, assistant building engineer, Wisconsin Industrial Commission, Madison, spoke on "Testing and Inspection." He talked about the Wisconsin Building Code and how it applied to the concrete block producers. Mr. Thern also mentioned the various testing methods used by the Commission to determine the strength, absorption, and other qualities of the block. Order No. 5306 of the Building Code states that a compressive strength of 1000 p.s.i is required on concrete units, with an individual minimum of 900 lb. (for one block). The absorption test requires 14 lb. of water per cu. ft. of concrete except for back up block. He also stressed the requirement that block should be branded with the company name or some identifying mark.

He stated that the requirements for cinders, to be used for cinder block, call for not more than 30 percent of combustible material, not more than 1 percent of sulphur, and not more than 10 percent of the cinders passing a 100-mesh sieve.

Mr. Thern said that approved lists of concrete units are sent to all city, state, and local inspectors, listing the size of the units and the date that the tests were made, and that these approval lists are good for one year from the date of the test. He also discussed specifications for mortar. The code calls for a proportion of 1:1:6 cement, lime putty, and sand but may be changed to 1:1:5 in the near future.

H. P. MCDERMOTT, mortgage manager, Wisconsin Retail Lumbermen's Association, Milwaukee, spoke on "Regulations and Priorities," dealing with the new restrictive orders.

At the close of the afternoon session a film, "Build with Concrete Masonry," was presented by Chas. W. Yoder of the Portland Cement Association.

A buffet supper followed the meeting which was, according to all, one of the best held during the existence of the Association.

Mineral Wool Officers

OFFICERS for the National Mineral Wool Association elected at the 1946 annual meeting are as follows: E. I. Williams, Riverton Lime & Stone Co., Riverton, Va., president; M. G. Jensen, Owens-Corning Fiberglas Corp., Toledo, Ohio, vice-president; Wharton Clay, Architectural Engineer, New York, N. Y., secretary; G. A. Petters, Johns-Manville Corp., New York, N. Y., treasurer. Directors include Mr. Jensen, Mr. Petters, Mr. Williams, A. M. Douglass, National Gypsum Co., Inc., Buffalo, N. Y. and N. A. Holmer, Carney Co,. Mankato, Minn.

Expand Operations

BROWN SAND AND GRAVEL Co., Albuquerque, N. Mex., has been purchased by Walter J. Burns and Weldon F. Lamar from Theodore R. Brown. The new firm, which will be known as Burns and Lamar, also will supply ready mixed concrete.

Quonsett Hut Plant

M. J. GROVE LIME Co., Stephens City, Va., has installed a new block plant with a capacity of 2000 block per day. It employs an Anchor tamper type block machine. A unique feature of the plant is the fact that it is housed in a Quonsett hut.

NO BOWL TO WEAR OUT on the DODSON-McCORD MIXER

PATENTED INTERCHANGEABLE STAVES are concave shaped and bolt to the drum ends to form the mixing drum. When any part of the drum becomes worn, it is easy to interchange one stave with another and proceed with the mixing. No outside drum or interliners required.

FAST, THOROUGH MIXING – Specially designed spiral blades mix quickly and thoroughly with low power demand. LOW MAINTENANCE COSTS – Each part and assembly are built for hardest use. Dust-proof, permanently sealed, self-aligning ball bearings throughout. Available in 9, 18, 33 and 42 cu. ft. capacities. Write for illustrative folder and prices.

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For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell end pipe at lowest cost.

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Cement Mill Improvements

DEWEY PORTLAND CEMENT CO. has an extensive program for reconstruction and modernization in 1946 at the Davenport (Linwood), Iowa, mill. Among the projects to be undertaken are the following:

A new packhouse and bag storage, to provide for installation of four Modern Valve Bag packing machines, increased trackage facilities for cement and crushed stone loading, dust collectors and woven wire belting for conveying of cement in sacks.

Installation of a 30,000 lb. per hr. (40,000 peak rating) steam capacity Edgemore radiant-tube type, stoker-fired boiler to increase steam generating capacity when waste heat boilers are down.

Completion of improvements to the screen house and crusher building, started in 1945, to increase capacity for production of crushed stone products, including the installation of a 36-in. belt conveyor to replace a 36-in. size in the transport of stone from the primary crusher in the quarry to the screening-recrushing plant.

A 100-ft. extension of the overhead craneway for handling agricultural limestone and raw materials for cement manufacture.

Installation of new all-welded Allis-Chalmers kiln ends on each of the three kilns to improve efficiency; two Allis-Chalmers air-quenching clinker coolers and remodeling of the existing cooler on one kiln; Merrick weightometers for measurement of kiln output; automatic controls on one kiln and controls for coal feed into the kiln.

Extension to the company's concrete dock facilities of 1000 ft. along the Mississippi river.

New Expanded Aggregate

CONTINENTAL ENGINEERING SERVICE, Chula Vista, Cal., has announced the development of a heating process for the expansion of perlite volcanic rock into a lightweight form, called Calite, which will have application in the manufacture of lightweight insulating concrete and for other insulation purposes. A new plant costing around $100,000 and employing over 500 workers is scheduled to be erected in Chula Vista. The perlite will be mined near Las Vegas, Nev.

Continental Engineering Service has been licensed to produce patented retorts and other equipment as well as the finished product. Otto Tatus, president and owner of the company, was formerly general manager of National Iron Works of San Diego. Frank Lister, design engineer largely responsible for the development of the process, is vice-president.

Monthly Block Output

LATEST available statistics of the Department of Commerce estimate monthly production of concrete block during 1945 to be about 29,000,000 units. This figure is a decline of 15 percent from the 1939 rate and must be more than doubled in order to meet the housing program and other non-residential construction anticipated this year.

Cement Production

BUREAU OF MINES reports that production of finished cement during January, 1946, totaled 9,633,000 bbl. or 51 percent above that reported for January, 1945. This is the largest gain reported for January for many years. Shipments of 7,391,000 bbl. were 52 percent above those reported for the corresponding month of the previous year. This substantial gain reflects the increasing demands of construction industry. Mill stocks of 18,668,000 bbl. were 13 percent below the January, 1945, figure. Demand for cement, as indicated by mill shipments, was higher than in January, 1945, in all districts except the Colorado, Wyoming, Montana, Utah, and Idaho district, which shows a decrease of 10 percent.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of January, 1946, and of January, 1945.

RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	Jan. 1946	Jan. 1945	Dec. 1945	Nov. 1945	Oct. 1945
The month	47.0	31.0	48.0	54.0	55.0
12 months	44.0	37.0	43.0	42.0	41.0

Pavement Yardage

AWARDS of concrete pavement for March and the first three months of 1946 have been announced by the Portland Cement Association as follows:

SQUARE YARDS AWARDED

	March, 1946	First 3 Mos., 1946
Roads	2,210,905	4,632,221
Streets and Alleys	625,677	1,412,786
Airports	69,775	321,306
Total	2,906,357	6,366,313

Organize Ready-Mix Plant

READY-MIX CONCRETE CO., Yankton, S. Dak., has been organized under the management of Maynard L. Larson. It is expected that by May 1 the plant will be under full production.

Sell Gravel Concern

F. H. GATES, Santa Maria, Calif., has sold his sand and gravel business to the Southern Pacific Milling Co., which he had conducted for 43 years. Mr. Gates also at one time was a large producer of concrete pipe.

Rebuild Pipe Plant

SHEARMAN CONCRETE PIPE CO., Tulsa, Okla., has been rebuilding its plant building. Two concrete pipe machines are now operated and a third will be added. A new boiler will be installed.

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EQUIPMENT AND ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Universal, Stearns, Blystone mixers and others.

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for *Accurate Sizing —Longer Service*

Hendrick Perforated Plate in vibrating and shaking screens assures uniform mesh throughout unusually long screen life. Perforations of any specified size and shape afford continuously accurate sizing. Hendrick Perforated Plate—including Hendrick High Carbon, Heat Treated Steel for abrasion-resistance and special alloy steel for corrosion-resistance — is supplied in any required gauge. Write for "Perforated Plate" catalog.

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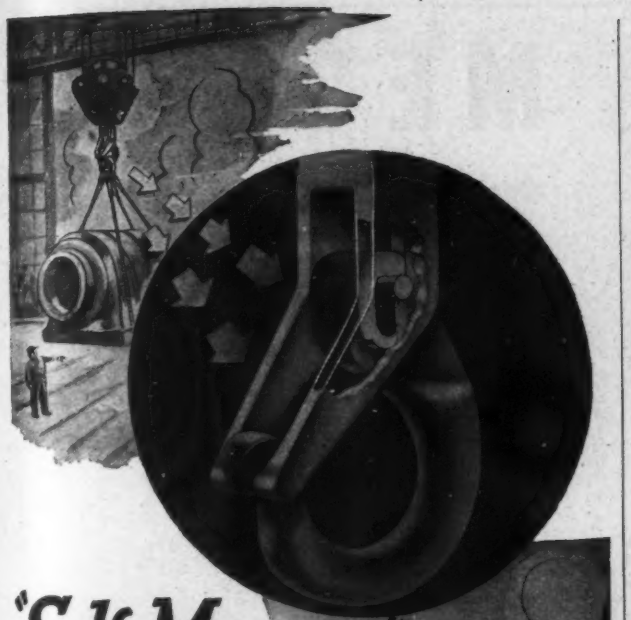

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Three types of ACLC Safety Hoist Hooks:

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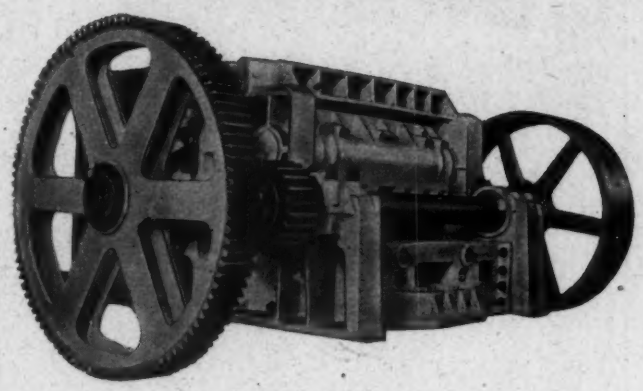
"PENNSYLVANIA"



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Six (6) sizes—capacity range 200 to 1000 tons hourly.

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REVERSIBILITY—alternate right and left-hand operation—insures symmetrical wear, maximum life of Impactors and Anvils—and the ultimate in accessibility and minimum operating cost.

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CONVERSIONS
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WE HAVE WHATEVER YOU NEED FOR YOUR DREDGE

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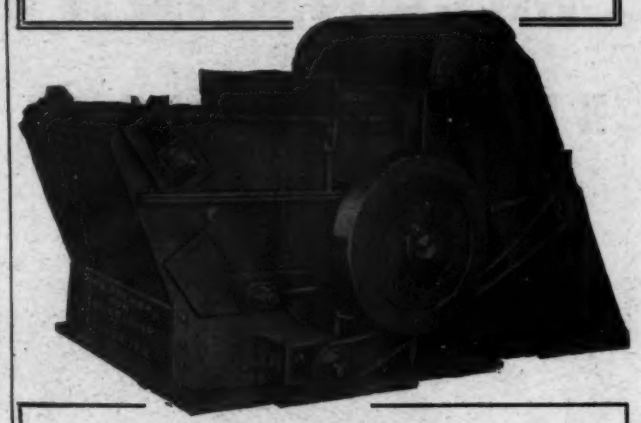

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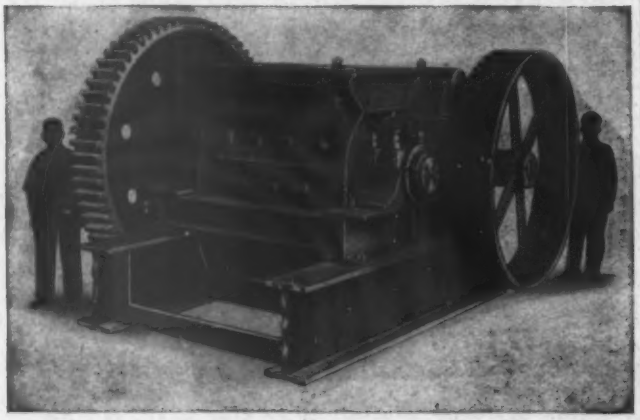

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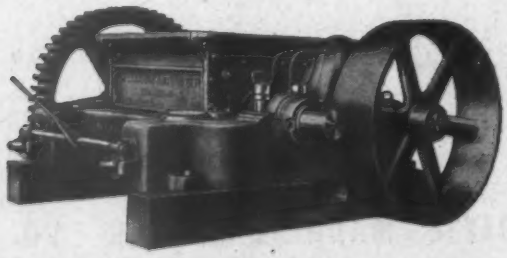

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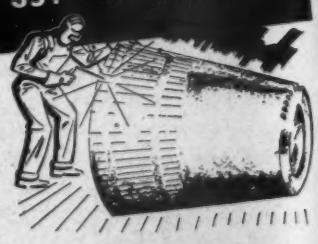

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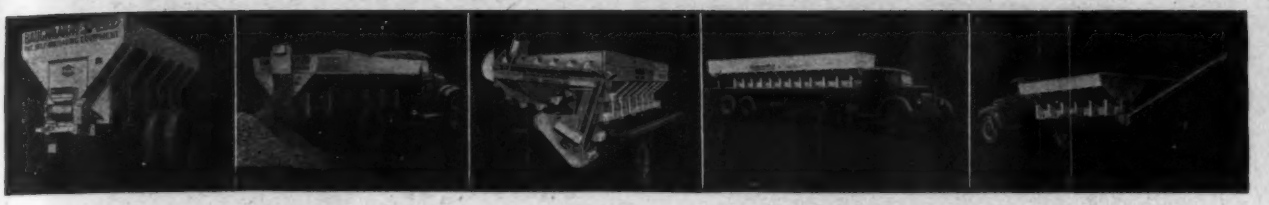

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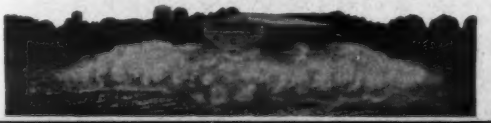
The New Baughman "Self-Unloading" Body is VERSATILE and RUGGED!

Baughman's New Model ASK-2 "Self-Unloading" Body is versatile—spreads lime, dumps rocks, delivers coal into bins, grain into cribs, or transfers its load to another vehicle.

Rugged—one standard body design capable of doing many specialized trucking jobs.

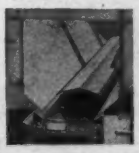
Constructed of high tensile, alloy steel (30% lighter, 17% stronger, and more abrasive resistant than ordinary steel). Ball and roller bearings throughout. Made in either Standard or Steep Sides—Lengths to suit your truck—Power take-off or motor driven—With or without attachments.

Ask for recommendations—we have a reliable dealer near you.



Baughman's All Steel, Standard 11 foot Model ASK-2 "Self-Unloading" Body with Spreader Attached.

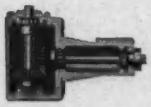
Patented and Patents Pending.



View of our heavy cut steel and bronze, 15 to 1, Gear Reduction. Simple, efficient, trouble-free. Will give years of service.

Model O Phosphate and Powdered Lime Spreader Attachment.

Cut-away view of our steel drag-chain with belt attached. Also note new type, adjustable, feed-choker.



View of our Distributor Case. Heavy, hardened and annealed cut steel gears.

manufactured exclusively by

BAUGHMAN MANUFACTURING CO., Inc.

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Manufacturers of the famous High Speed Self Unloading Equipment

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Williams Type **BUCKETS**

• You get longer service with less maintenance when you use Wellman Williams buckets because this quality line pioneered the field in welded construction of high-grade rolled steel. *Wellman-built means better-built!*

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JAEGER

Modern in design, in construction, and in performance.

ASK FOR NEW CATALOG!

Describes outstanding improvements in mounting, transmission, water system, operating speed, etc. (both top and end loaders.)

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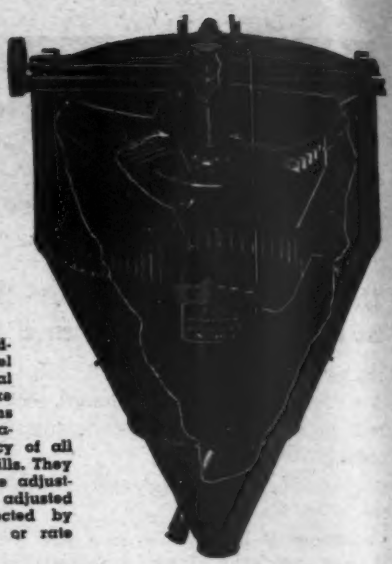
a Leader

GAYCO

Centrifugal Air Separator



The features embodied in the new model GAYCO Centrifugal Air Separator make them a leading means of increasing the capacity and efficiency of all types of grinding mills. They have quick, positive adjustment. When once adjusted they are not affected by variation in speed or rate of feed.

They require very little power to operate. And they feature the exclusive GAYCO principle of rejecting coarse particles by means of a centrifugal sizing fan. They separate 99% through 325 mesh, and give 25% to 30% greater recovery of fines.

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ROBERT M. GAY DIVISION 117 Liberty St. New York 6, N. Y.

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- Present hydraulic hoist furnishes lifting power.
- Truck driver operates loader with present hoist lever
- All operations in front and in full view of driver.
- ½-yard scoop, sturdy construction, easy to attach and remove. Low priced.

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Every "DAY" delivers in a Big Way

The "DAY" Swing Hammer Roller Bearing Pulverizer gives exceptionally wide crushing range at low operating cost. Efficient producer of road stone and agstone. Capacity 15 to 30 tons per hour ½" screen size.

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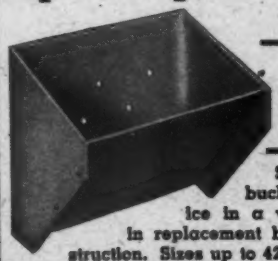

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TYLER-NIAGARA SCREENS

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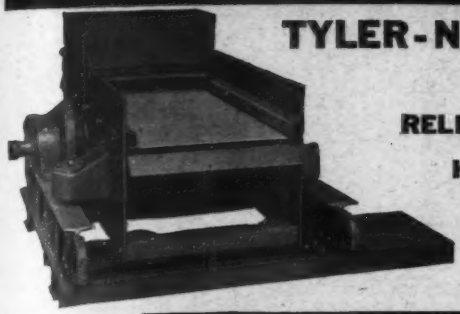
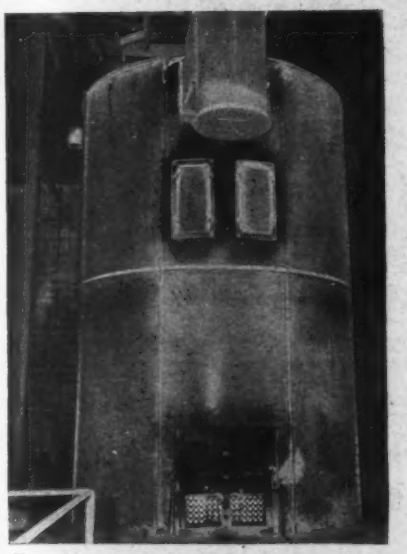


2' x 4' Type 100 Tyler-Niagara Screen

8' x 14' Type 808 Tyler-Niagara Screen

THE W. S. TYLER COMPANY, Cleveland 14, Ohio

EHRSAM EQUIPMENT *Leads* for making GYPSUM



Above is pictured the 17-ton Ehrsam calcining kettle, standard for the industry

EHRSAM manufactures a complete line of equipment for making gypsum wallboard and for processing many other non-metallic materials.

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Enterprise, Kansas

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BLAW-KNOX DIVISION of Blaw-Knox Company
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A MOUTHFUL at EVERY BITE

This is not only the claim of OWEN, the name symbolic of the highest grade Excavating and Handling Buckets for years. — Operators everywhere, "on and off" the job, volunteer this testimony.

And — there's a reason. Owen-engineered buckets incorporate special features which have been continually improved.

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WELLSBURG, W.VA.

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HAMMOND BAG & PAPER CO.

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ON BOTH STANDARD TYPES

—on **STEELGRIP** Steel Lacing that is applied with a hammer. 11 sizes—convenient boxes or long lengths for wide belts. Have 2-piece hinged rocker pins.

—on **WIREGRIP** Belt Hooks that are applied with any lacing machine and come with extra blue aligning cards (patented) that assure uniform tension on every hook and prevent card-end waste.

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Wire screens powerfully and accurately built to resist the slam bang service of Vibrators are available in all openings and grades. Rapid wear is effectively reduced by the use of stalwart steels.

Stop losses! Write today.

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FREE SERVICE *for BUYERS*

Here is the quick way to get information and prices on machinery and equipment. Just check the item (or items) listed below about which you desire information. Then send this page to us, and we will take care of the rest.

TEAR OFF HERE

- ....Admixtures, Aggregate
- ....Aftercoolers, Air
- ....Aggregates (special)
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- ....Bagging Machines
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- ....Barges
- ....Batchers
- ....Belting, Conveyor Elevator, Power Transmission
- ....Belting, V-Type
- ....Belt Repair Equipment
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- ....Blasting Supplies
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- ....Bodies, Trailer
- ....Brick Machines and Molds
- ....Buckets
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- ....Classifiers
- ....Clutches
- ....Coal Pulverizing Equipment
- ....Concentrating Tables
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- ....Coolers
- ....Cranes
- ....Crushers
- ....Derricks
- ....Dewatering Equipment, Sand
- ....Diesel Engines
- ....Dragline Cableway Excavators
- ....Draglines
- ....Dredge Pumps
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- ....Grinding Media
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- ....Hoists
- ....Hoppers
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- ....Locomotives
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- ....Mills
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- ....Screen Cloth
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- ....Scrubbers: Crushed Stone, Gravel
- ....Shovels, Power
- ....Speed Reducers
- ....Tanks, Storage
- ....Tractors
- ....Trucks, Industrial
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If equipment you are in market for is not listed above, write it in the space below.

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Belt Trippers for 14", 16", 18", 20" and 24"
Dings Magnetic Pulleys, 30" diam. 30" face
Garvey Magnetic Pulleys, 30" diam. 18" face
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60' Super Capacity Enclosed Elevator, 16" Buckets
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1500' Engr. Chain type A-121, Steel Bushed

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4'x10' Double Deck Gyrex Vibrating Screen
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3'x5' & 4'x5' 2-deck Hummer Vibrating Screens
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Conical Screen: 28" & 44" diam. 54" long, 1" perf.
Revolving Screens: 5'6" diam. 10' long, 1" perf.

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A-C Gyratory 3-D Reduction Crusher
Traylor Bulldog 11" Gyratory Crusher
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Wheeling 8"x15" Jaw Crusher
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4th & Ferry Streets, LAFAYETTE, INDIANA
Equipment for Sale at Elwood, Ind., April 1, 1946

1—Anchor Spud hoist with 20 HP 2200 volt motor.
1—Swintek 65' dredging ladder. 24 tons.
3—General Electric Co. Transformers 34500 volts to 230-460 volts.
1—15 x 36 Universal Jaw Crusher.
1—9 x 36 Cedar Rapids Jaw Crusher.
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1—300 H.P. 505 RPM electric motor.
Several 40 and 50 H.P. electric motors at various speeds.
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20 ton, 24'x10' Truck Scale.....$575.00
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Batching Scales all sizes and capacities
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DERRICKS IN EXCELLENT CONDITION LIKE NEW.

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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. 1,000 cu. ft.

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1—No. 2 Climax jaw crusher, size 9x16".
1—Buchanan jaw crusher, 10x16".
1—Acme jaw crusher, Ser. No. 1873, size 12x20".
1—No. 3 Champion jaw crusher, size 7½x13".
1—United Iron Works, "Blake-type" jaw crusher, size 9½x24".
1—Sawyer Massey jaw crusher, size 9x18".

DERRICKS

4—Steel guy derricks. 2—20 ton American steel guy derricks. 1—110' mast, 110' boom; 1—100' mast, 90' boom. 1—15 ton American steel derrick, 83' mast, 75' boom. 1—5 ton Terry Guy Derrick, 70' mast, 60' boom.
2—Stiff leg derricks.
1—15 ton Clyde, 30' mast, 45' boom. 1—11 ton Fort Pitt, 28' mast, 70' boom. Also a number of wood stiff leg derricks, 1 to 5 ton cap.

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Steam, ranging from 8 H.P. to 60 H.P., single, double and triple-drum; all standard makes

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Column Drifters and Tripods

4—Model 17 Denver rock drills.
3—Sullivan high-speed drills, Model FG-3.
5—Ingersoll Rand type X71 drifters.
4—Gardner Denver drills with drifter mountings.

JACKHAMMERS

8—Jackhammers, consisting of Hardsoco, Worthington and Cleveland. 45 lb. and 85 lb. class.
4—Ingersoll Rand Model BCR-430 jackhammers, 47½ lb.
1—No. 3 Hardsoco, 50 lb.

WAGON DRILLS

2—Gardner Denver derrick drills with Model 21 Gardner Denver drill; will drill 30 ft.
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2—Ingersoll Rand, Model FM-2, with air hoist and IX71 drill, mounted on 3 steel wheels; will handle 20 ft. steels.
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WE ALSO HAVE A LARGE STOCK OF DRILL STEEL WITH MISCELLANEOUS TIMKEN BITS.

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Each replaced for larger sizes. These are rebuilt and 100% efficient—90% new.
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We have a number of lime feeders and a number of hydrate feeders.
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One complete Lime Hydrating Plant, including buildings.
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Lot parts and complete set of cats, for 76 Marion.
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4 and 6 ton Plymouth, 7 ton Whitcomb and 16 ton Vulcan Gas Loco.; 36" ga.
Lot 36" ga. cars.
1600 ft. used 2" pipe, 120'—8" pipe.
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1—20 x 12 Jaw Crusher.

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Telesmith rotary screen, 5 sections, 5' dia. 25 feet long. Complete with motor, switches, 2 extra pinion drive gears, 26 extra pieces of screen.

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Mauricetown, N. J.

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GOOD CONDITION — READY FOR LOADING

2—Vulcan Rotary Dryers 6'x64'
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1—1"x8" Fuller-Kinyon Pump, Type H, Cat F-K, 2A
2—Allis-Chalmers Tube Mills 7'x22'
1—Smidth Tube Mill, 5'6"x22'
1—Allis-Chalmers Tube Mill 6'x22'
1—No. 8745 Allis-Chalmers 8'x45' Compeb, 4 compartment mill

SPECIALS

20 ton G.E. Electric Locomotive, 500 Volt DC

5000 KW Westinghouse Turbo-Generator, 3600 RPM, 200 lbs. pressure, condensing, 2300/60/3, complete

800 KW Westinghouse M-G set, syn. Motor, 1150 HP, 514 RPM, 13200/60/3. Generator 250 Volt DC with direct connected exciter, complete with starter and panel boards

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3—Vulcan 8'6"x7'6"x125'
3—Mosser 5'6"x5'x60'
1—Vulcan 7'6"x7'x125'
1—Vulcan 7'6"x6'9"x150'.

DRYERS

2—Mosser 5'6"x5'x22'6"
1—Mosser 6'x5'x55'
1—Ruggles Coles A-8 Double Shell

MISCELLANEOUS

No. 3 Williams Hammer Mill, 6 rows of hammers, 8/row
30x24 Jeffrey Type Swing Hammer Pulverizer
Dings Magnetic Separator IR14, 110 Volt, 86 RPM, complete with M-G set
3600 sq. ft. Wheeler Surface Condenser
2—50 HP Jones Herringbone Speed Reducers, ratio 93.5:1
1—Schutz O'Neill 18" Pulverizer
1—Schutz O'Neill 20" Pulverizer
1—Kent 26" Pulverizer
1—Raymond Pulverizer 5-0
1—Schutz O'Neill 20" Pulverizer
700 HP G.E. Type KF Motor, 2300 60/3, 1500 RPM
50 KW West. M-G set, 1200 RPM, 125 Volt DC, 75 HP Motor, 2200/60/3
75 HP Westinghouse Turbo-Gen. 200 lbs. pres., 7200 RPM geared to 50 KW 125 Volt DC 1200 RPM Generator
1000 HP. G.E. 600 RPM 6600/60/3 Slip Ring Motor with controls.
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ALSO PUMPS—COMPRESSORS—TANKS—MOTORS—BOILERS—POWER PLANTS

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1—420 cu. ft. Schramm Diesel portable compressor.
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1—20-yd. WESTERN Air Dump Car, Vertical Cylinders.
2—2200 and 3300 cu. ft. Chicago Pneumatic stationary Air Compressors—400 & 500 H.P. Synchronous motors.
1—40-ton American Diesel Locomotive Crane—1942.

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80 Ton American Locomotive, 0-6-0.
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¾ Yd. Koehring Gas Crane, Model 301.
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P & H Model 700, crane, 1½ yd. cap.
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P & H 600 crane, 1 yd. capacity.
P & H 600A shovel-crane, 1 yd. capacity.
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Speeder D4, ⅜ yd. shovel, Diesel powered.
Speeder ½ yd. shovel crane and backhoe.
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Byers Bear Cat ½ yd. crane.
Byers Bear Cat ½ yd. backhoe and crane.
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Bucket elevator, vertical, 35', 22" buckets.
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Dredge, 12" Diesel hydraulic.
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500 drill bits, 1-R and Timken. Various sizes.
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Several dredge pumps available from 6" up.
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Cedar Rapids Portable 60-80 tons per hour cap.

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Roll, 54x24, 54x20, 48x36, 36x24.
Allis-Chalmers 42" gyratory.
Gyratory crusher: K.V.S. 30, 37-S, 49; 32, 8A, 8B; Traylor 8"; McCully, 13", 8", 6".
Allis-Chalmers 6" fine reduction crusher.
Jaw: 6x12, 9x16, 10x20, 14x24, 12x26, 13x30, 16x32, 24x50.
Complete Rock Crushing, Sand and Gravel Plants.

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Hayward ⅜ yd. Clam, digging.
⅜ yd. Williams Clamshell, digging.
½ yd. Haiss Clamshell, rehandling.
¾ yd. Haiss Clamshell, rehandling.
10 Battleship 2-3 yd. steel stone skips.
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30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
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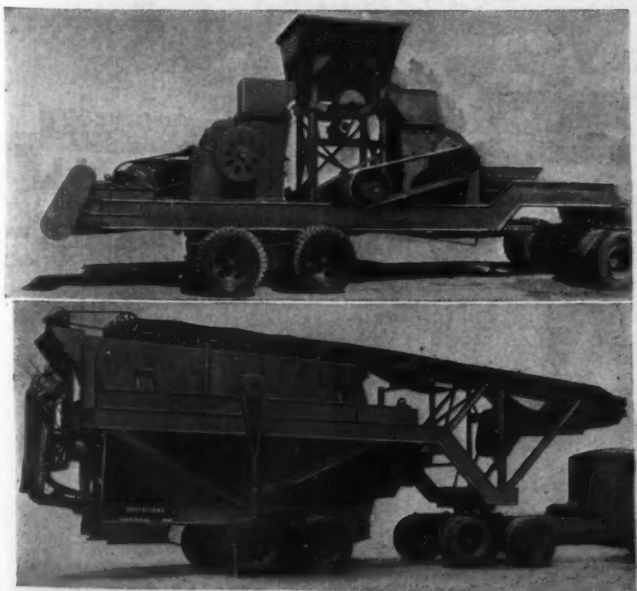
Return Chute	—To chute oversize to conveyor feeding pulverizers.

There's profit in aglime production. Universal plants produce aglime at a cost that leaves more profit.

UNIVERSAL ENGINEERING CORP.
617 C Ave., West, Cedar Rapids, Iowa



There's profit in aglime production. Universal plants produce aglime at a cost that leaves more profit.

FOR FORTY YEARS
UNIVERSAL
ROCK AND GRAVEL CRUSHING
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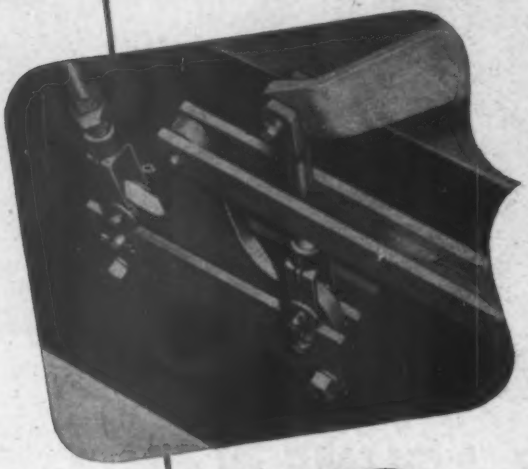
ASPHALT PLANTS · SPREADEROLLERS

HOW TO . .

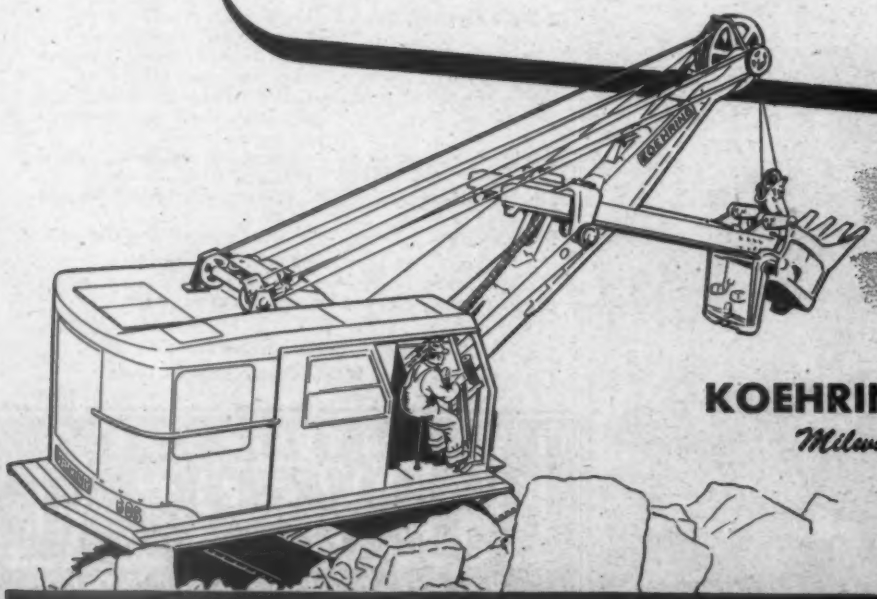


KEEP THE OPERATOR FRESH

A total of 7 hours out of every 8, the shovel operator has his hands on the levers controlling crowd-retract and swing-traction. Make them easier to move and production goes up as operator fatigue goes down. On the Koehring 605, these levers move easily, smoothly, with minimum pull, because double fulcrum units have been built into the linkage. Double fulcrum units eliminate clutch overtravel, increase accuracy of control, give the operator an important mechanical advantage every time he swings, travels, crowds or racks in.

KEEP THE OILER SAFE . . .

With this safety catch set, oiler, or operator, works in complete safety when lubricating the Koehring 605. Main engine clutch cannot be engaged, machinery cannot be set in motion. Safety catch, located on the left front platform, is quickly and easily set and as easily released.



KOEHRING

605

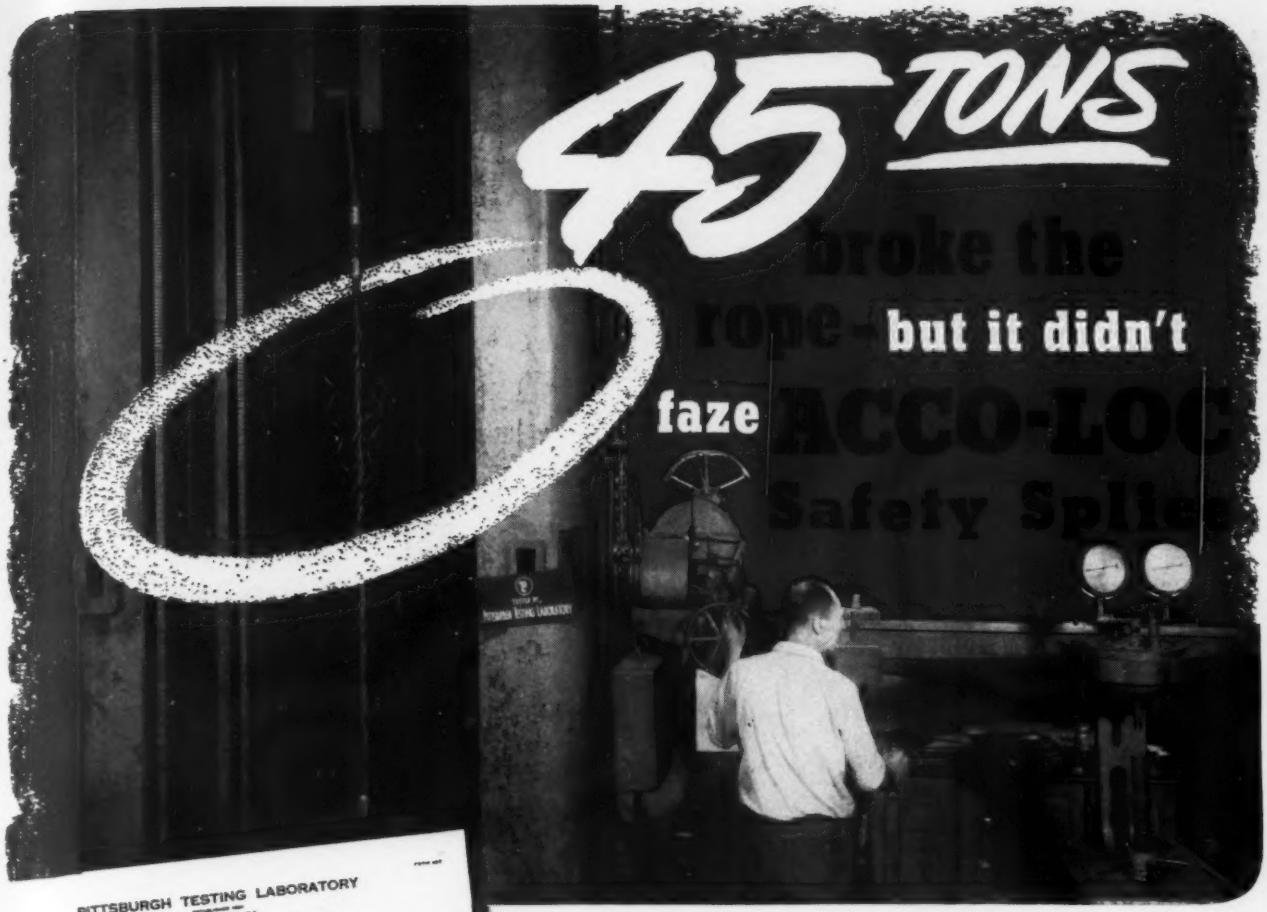
1½ YARD SHOVEL

KOEHRING COMPANY

Milwaukee 10, Wis.

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT



PITTSBURGH TESTING LABORATORY
PITTSBURGH, PA.

LABORATORY No. 363283
FILE No. 11209.19

REPORT
July 14, 1945

Tensile test of - Wire rope assemblies made of 6x19 PREFORMED Improved Plow Steel Wire Rope with Independent Wire Rope Center with ACCO-LOC SAFETY SPLICE Loop on each end.

Reported to - American Chain & Cable Co., Inc.
Wilkes-Barre, Pa.

TEST NO.	ROPE DIAMETER	ACTUAL BREAKING STRENGTH	MINIMUM REQUIRED BREAKING STRENGTH	TYPE OF FRACTURE
1	3/8"	14,680#	12,800#	4 strands & center
2	3/8"	14,680#	12,800#	6 strands & center
3	3/8"	14,680#	12,800#	5 strands & center
4	1/2"	26,010#	22,400#	4 strands & center
5	1/2"	25,850#	22,400#	4 strands & center
6	1/2"	26,050#	22,400#	4 strands & center
7	3/4"	51,250#	49,900#	3 strands & center
8	3/4"	50,900#	49,900#	4 strands & center
9	3/4"	51,750#	49,900#	3 strands
10	1"	91,000#	87,600#	4 strands & center
11	1"	94,550#	87,600#	3 strands & center
12	1"	93,050#	87,600#	3 strands & center

RESULTS:
1. All specimens exceeded the minimum required breaking strength.
2. After testing, all ACCO-LOC SAFETY SPLICES were intact. None showed visible deformation.

NOTES:
1. All minimum breaking strengths from Federal Specification RR-W-371a for Wire Rope, dated May 9, 1945. Reference Table XVI for 3/8" dia. rope, plus 7-1/2% for IWRC. Reference Table XVIa for 1/2", 3/4" and 1" dia. wire ropes.
2. For tests 1 to 9 and 12 inclusive speed of testing machine 1-1/16" per minute.
3. For tests 10 and 11 speed of testing machine 7/16" per minute.

PITTSBURGH TESTING LABORATORY
R. B. Lincoln
Physical Test Section

3/8" to 1" TRU-LAY Preformed wire ropes, equipped with ACCO-LOC Safety Splices, pulled to destruction — without the slightest effect on the rope terminals. That test was made by the Pittsburgh Testing Laboratories. But it is in the thousands of plants where ACCO-LOC Safety Splices are daily proving their 100% efficiency that the test of true worth is appreciated. — Compact, neat, flexible, made without distortion of rope structure, the ACCO-LOC Safety Splice is a revolutionary advance for wire rope endings. Send today for fully detailed literature.

ARMY NAVY E

ACCO Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Emlenton, Pa., Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Seattle, Bridgeport, Conn.

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AMERICAN CHAIN & CABLE

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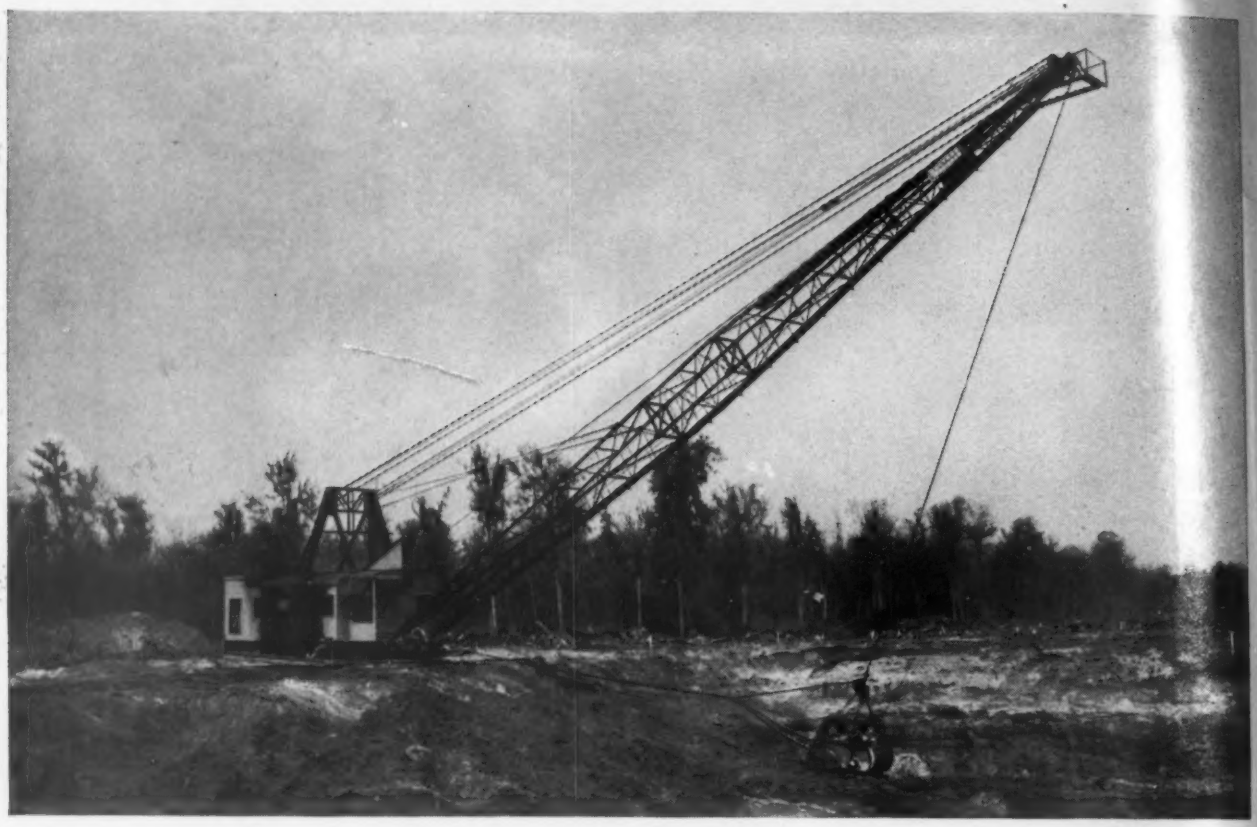

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Over rough ground or soft, Bucyrus-Monighans walk smoothly, cushioning down their weight evenly with each step, without the bumps or jars that cause destructive stresses. That's why their walking action lasts . . . why they step out safely, positively, and gently even after moving 15 or 20 million cubic yards. Their "years ahead" digging speed and smoothness lasts, too, because machinery design has the simplicity that keeps maintenance requirements low, digging efficiency high through many years of hard service.

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